Volume 94 Number 16

STEEL

Production • Processing • Distribution • Use

The Week in Perspective

ALTHOUGH there seems little doubt that business week by week is mounting to new heights, questions remain to be answered. Chief among the latter are the administration's future path—left or right? And what is to be done about restive labor? p. 10

MAPI CODE (machinery and allied products), now effective, is of an unusual type, setting forth only general code provisions for 39 subdivisional industrial groups, each of which may file a supplemental code. p. 19

HEARINGS ON THE WAGNER BILL have brought into the limelight the political strength of some 27,000,000 non-unionized industrial employes, a mighty army of votes when compared with the highly organized minorities which have wrung special favors from the government. p. 22

CHARCOAL IRON STACKS in Michigan, some idle for over two years, are being prepared for resuming blast, an encouraging indication of the volume of new pig iron business. p. 15

MORE OPEN HEARTHS are being placed in operation, and the national rate of steel production again has crossed the half-way mark, at the end of last week resting at 51 per cent, up three points. Further increase is expected this week. p. 10

BATTLEDECK FLOORS (flat steel plates welded to I-beams) have been tested under live loads of over 400 pounds per square foot, and have shown no signs of collapse or rupturing of welds. p. 46

LAST YEAR'S PRICES on iron ore have been reaffirmed for one 50,000-ton inquiry, but with lake transportation costs estimated at 25 per cent higher open-market price levels may move up. p. 12

DETROIT LABOR WEATHER continues to be "highly unsettled" with difficulties at leading parts plants attesting their vulnerability in the auto production industry. p. 16

YOUR 1934 CHAMPAGNE may be of the variety which it is claimed can be aged in 72 hours, with the use of a 6000-gallon welded chrome-nickel steel carbonating and cooling tank, lately constructed. p. 34

SIGNIFICANT CHANGES in railroad purchasing methods are in the wind. Stimulated by the government, they include centralization of purchases, adherence to present or improved standards, increasing size of orders, suppression of reciprocal buying. p. 15

CONTROLLING BLAST at the combustion zone of a German blast furnace by means of a regulating piston has saved coke and improved furnace operation. p. 49

NEW STEEL FRAMING for residences, another recent development in the steel house field, is of the insulated type, shop fabricated, easily assembled and readily adaptable to various types of architecture. p. 30

PROMISING MARKET FOR COPPER is seen in the expanding use of copper-bearing rolled steel, the red metal improving physical properties and corrosion resistance. p. 32

GUARDING THE BORDERS of the million-odd miles of surfaced roads in this country is a job for steel and one which is visioned as an outlet for millions of tons in the form of plates, cable and wire mesh, used in most modern road guards. p. 27

CLASSIFICATION OF COAL has been proposed and the matter referred to a special technical society committee, the latter having developed a system for ranking all coals according to degree of metamorphism. p. 37

STRAINING WATER used in steel mills, to remove scale and slag, is accomplished by a new twin-basket strainer, arranged to be self-cleaning. p. 40

DIFFICULTIES IN GALVANIZING sheets rolled on 4-high mills have been encountered. Work is being done on several systems for eliminating these troubles by further conditioning sheet surfaces. p. 51

Industry Anticipates Respite From Antagonistic Policies

AFTER months of strife, industry now anticipates a period of fewer distractions, of less antagonistic action from Washington and perhaps of gradually easing labor problems.

While the hope for such much-to-be desired moderation is well grounded, the way to a smoother pathway is not yet clear. First, the automotive labor situation still threatens. Second, demonstration that the administration actually is turning away from radical experiment will be required before confidence can return in full force.

If these two problems can be solved promptly, industry could count upon several months of good progress. Business volume clearly is expanding. Wages again have been increased generally. Steel producers figure that since the effective date of their code, wage increases alone have swelled the cost of various finished steel products by from $6 to $12 per ton. The total increase in cost per ton is much greater because the foregoing does not include the higher price of materials and supplies, which have mounted from 20 to 40 per cent.

Selling prices have not been advanced as fast as costs have risen. For this reason, industry hopes for and anticipates a period of relief from industry-baiting by Washington and from sniping from organized labor.

Labor

THE strike at the Kenosha and Racine plants of Nash Motor Co. seemed to be on the way to settlement, when employes Friday voted to accept the terms of the automobile labor board. Maladjustments in the proposed higher wage rates remain to be ironed out. Also the settlement is contingent upon acceptance of the board's terms by the employes of the Seaman Body Corp. division of Nash. If all conditions are met, the Nash and Seaman plants probably would resume operations April 16.

Tool and Die Men Out

Several thousand tool and die workers in Detroit, members of the Mechanics Educational Society of America, voted Thursday night to strike after employers had refused their demands for higher wages. The action was directed at about 90 jobbing shops contracting for maintenance work in automobile plants. Late Friday it was clear that many employes were not satisfied with the strike vote. A score or more of the larger jobbers were unaffected by the strike.

Advance Amalgamated Scale

Although the yearly wage contract between the Western Sheet & Tin Plate Manufacturers association and the Amalgamated Association of Iron, Steel and Tin Workers does not expire until June 30, members of the employers' group voluntarily have advanced wages 10 per cent, in line with the 10 per cent increase in other departments of the iron and steel industry which became effective April 1.

Under the contract, wages are raised or lowered according to changes in actual average sales prices of Nos. 26, 27 and 28 gage black sheets. Independent of this, however, the base rate has been raised to net the wage advance. A 15 per cent increase was granted voluntarily by similar adjustment of the base last fall.

Newport Employes Return

Differences between the Amalgamated Association of Iron, Steel and Tin Workers and the Newport Rolling Mill Co. were settled Friday, 900 employes returning to their jobs.

"Recognition" Is a Tricky Word in Labor World

IN AUGUST last year a group of steel company presidents withdrew from a conference in Washington when William Green, president of A. F. of L., attempted to sit with them. One of the reasons for the action of the steel men was that had they conferred with Mr. Green, every A. F. of L. organizer in the country would have said to steel employes, "See your bosses and our boss are getting their heads together. Your bosses are recognizing A. F. of L."

How correctly the steel executives diagnosed the situation is indicated by an incident in Cleveland last week. At the request of the automobile labor board, Cleveland officials of the Fisher Body division of General Motors granted an "informal interview" to a few A. F. of L. representatives.

Immediately many newspapers came forth with headlines "Fisher Body Recognizes A. F. of L." A stern statement of denial from E. F. Fisher, general manager of Fisher Body, was required to effectively stop the malicious report of "recognition."

Production

STEELMAKING operations last week rose 3 points to 51 per cent, with Pittsburgh up 3 points to 39 per cent; eastern Pennsylvania 3½ to 38½; Youngstown 2 to 57; and Chicago 1½ to 50. Wheeling district rose 7 points to 69; Cleveland 2 to 69. Detroit was down 6 to 82, and New England 4 to 78, while Buffalo held at 50 and Birmingham 52. Higher operations this week are indicated at Pittsburgh, Youngstown, Chicago, eastern Pennsylvania and Buffalo.

Pittsburgh—Advanced 3 points last week to 39 per cent, the gain being supported by all producers. This week a 1-point advance will place the district's operations at 40 per cent, which will be the first time at that level since last summer.

Twenty-two out of 60 steelworks blast furnaces are in. For the time being, individual blast furnace rates here are as follows: Carnegie Steel Co., 9 out of 32; Jones & Laughlin Steel Corp., 6 out of 11; Bethlehem Steel Co., 4 out of 7; and Pittsburgh Steel Co., American Steel & Wire Co. and Pittsburgh Crucible Steel Co., 1 out of 2 each.

Wheeling—Increased 7 points to 69 per cent last week, with schedules being maintained in 27 out of 39 open hearths. One mill added three more active open hearths.

Detroit—Steel ingot production in this district declined 6 points to 82 per cent last week, 14 out of 17 open-hearth furnaces being in operation.

Birmingham—Held at 52 per cent last week, with Fairfield, Ensley and Gadsden reporting 13 open hearths producing ingots.

Buffalo—Held at 50 per cent last week, with indications pointing to an increase to 56½ per cent this week due to three open hearths being added, making 22 out of 38 open hearths in operation.

Chicago—Increased 1½ points to 50 per cent last week, with this schedule or slightly better expected to prevail for the near future.

Cleveland-Lorain—Up 2 points to 69 per cent, with the National Tube Co. operating all of its 12 open hearths; Corrigan, McKinney Steel Co. 9; and Otis Steel Co., 6. An increase in the number of active open hearths in Cleveland is expected.

New England—Off 4 points to 78 per cent last week, with all but three basic open hearths operating. Little change is indicated for this week.

week, with indications pointing to a further advance this week. Finishing operations of most plants have been increased more sharply.

Youngstown—Advanced 2 points to 57 per cent last week, with the rate expected to reach 59 per cent this week. Youngstown Sheet & Tube Co. will schedule its Brier Hill works soon if the buying wave continues, which will increase the operating rate 4 to 6 points. Valley steel orders in the first 11 days of April averaged 21 per cent above the same period in March.

U. S. Steel Shipments Rise

Shipments of finished steel by the United States Steel Corp. in March were 588,209 tons, compared with 385,500 tons in February, an increase of 202,709 tons. Three months total in 1934 is 1,305,486 tons, compared with 817,860 tons in the same period of 1933 and 1,227,851 tons in 1932.

STEEL CORPORATION SHIPMENTS

(Tons)

	1934	1933	1932	1931
Jan.	331,777	285,138	426,271	800,031
Feb.	385,500	275,929	413,001	762,522
March	588,209	256,793	388,579	907,251
3 Mo.	1,305,486	817,860	1,227,851	2,469,804
April		335,321	395,091	878,558
May		455,302	338,202	764,178
June		603,937	324,746	653,104
July		701,322	272,448	593,900
Aug.		668,155	291,688	573,372
Sept.		575,161	316,019	486,928
Oct.		572,897	310,007	476,032
Nov.		430,358	275,594	435,697
Dec.		600,639	227,576	351,211
Less yrl. adj.		44,283	5,160	6,040
Tot.		5,760,952	3,974,062	7,676,744

Financial

MANY annual meetings of industrial corporations are being marked by a more than usual inquiry by stockholders as to details of administration and by improved financial conditions reported by the officers. In numerous instances, chairmen report marked gains at the end of the first quarter of 1934.

Bethlehem Is Earning on Preferred

Speaking at the annual stockholders' meeting of the Bethlehem Steel Corp., April 10, Eugene G. Grace, president, said that "the trend of business is encouraging. Bethlehem showed preferred share earnings in March. I am hopeful that the second quarter will show a profit." Current operations of the Bethlehem company are at fully 52 per cent of capacity.

In response to a question by a stockholder as to the resumption of preferred dividends Mr. Grace said the disposition will be to resume payment on the preferred as soon as possible. He was of the opinion that business in the second quarter will go a long way toward earning the preferred dividend for that quarter. Also he said there would be some balance for preferred in March.

Mr. Grace characterized the steel code as one which gives an opportunity for proper consideration of employes, the consumer and the owners of the business. He said NRA is an emergency measure and it is well to so regard it for the present.

Questioned again by a stockholder, Mr. Grace said there has been no dictation on the part of the government in the operation of the steel code; adding that there has been fine co-operation on the part of the government in the administration of the code.

Bonus payments were questioned by stockholders and Mr. Grace replied that officers and directors have received no such payments since 1931. Discussion of the $250,000-a-year salary of Charles M. Schwab culminated in a vote of confidence for the veteran chairman of the board. The salary was said to be but partial repayment for Mr. Schwab's past sacrifices and services in behalf of the company.

All directors were re-elected.

Republic in Black in March

A substantial comeback in the volume of business of the Republic Steel Corp. in March—"sufficient to almost offset the losses of the first two months"—was reported by Tom M. Girdler, chairman and president, at the annual meeting of the corporation's stockholders on April 11. A small operating loss for the first quarter will be shown, he predicted.

Mr. Girdler said that he had attended meetings of employes representatives at Youngstown and Warren and found the labor attitude at the mills very good. He did not believe a great percentage of Republic employes are affiliated with American Federation of Labor unions. He reported the company to be operating at 55 per cent of capacity.

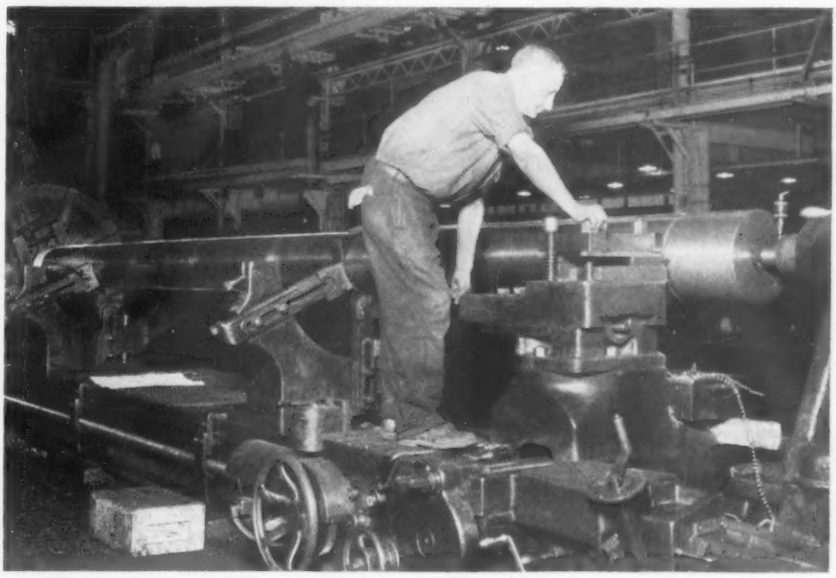
W. G. Collins was elected a director to fill a vacancy on the board.

Westinghouse Orders Increase

When Westinghouse Electric & Mfg. Co. stockholders gathered for the annual meeting last week, a youthful employe arose in the rear of the room and talked for over 20 minutes with President F. A. Merrick and Chairman A. W. Robertson. This man, E. R. Daly, a sales department employe, suggested, "It would be a mighty good thing for this company's executives to meet with small groups of employes and get their ideas." Board Chairman Robertson replied, "I think this is a good suggestion and I believe we will follow it."

President Merrick told stockholders that first quarter orders showed an increase of 57 per cent over the same 1933 period.

Caterpillar Tractor Co., Peoria, Ill., completed, April 2, the retirement of its $10,000,000 bonded indebtedness incurred in 1930 to



LARGEST BOLT IN THE WORLD? So the Westinghouse Electric & Mfg. Co.'s Philadelphia works claims. This bolt is 25 feet 10 inches long, 13 inches in diameter, weighs almost 6 tons, and will be used to hold together 60-inch diameter metal disks comprising the rotor for a generator for the Philadelphia Electric Co. Physical properties of the bolt are: Ultimate tensile strength, 100,000 pounds per square inch; yield point, 75,000 pounds per square inch; elongation, 18 per cent; reduction of area, 40 per cent

SIGHTSEEING VIA STEEL: On these wire ropeways connecting San Sebastian and Miramar, Spain, are four cars, each carrying 20 passengers, affording a view of the beautiful harbor. In the towers are restaurants. Wide World photo

finance a building program made necessary by an unusual increase in sales. The 5-year gold notes were called in from one to four years before maturity.

¶Newton Steel Co., affiliate of Corrigan, McKinney Steel Corp., in 1933 had a net loss of $1,026,795, after taxes, interest, depreciation, etc., as compared with a net loss of $999,195 in 1932.

¶National Steel Corp. has declared a regular quarterly dividend of 25 cents a share payable April 30 on stock as recorded on April 20.

¶Davison Coke & Iron Co., Pittsburgh, reduced its loss from $295,140 in 1932 to a net loss of $1568 in 1933. However, in both years no depreciation was taken on the Neville Island plant.

¶Pittsburgh Steel Foundry Co., Glassport, Pa., reports net loss of $59,033 in 1933, compared with net loss of $320,890 in 1932.

¶Interlake Steamship Co., Cleveland, showed a net profit of $446,337 in 1933, compared with net loss of $317,770 in 1932.

¶Koppers Gas & Coke Co. and subsidiaries, Pittsburgh, report for 1933 net income of $2,457,432 equal to $12.28 a preferred share, comparing with net income of $2,127,869 in 1932, which was equal to $10.63 a preferred share.

¶Steel Co. of Canada Ltd., Hamilton, Ont., reports profit of $1,902,785 for 1933, compared with $1,435,873 in 1932.

¶Milton Mfg. Co., Milton, Pa., reports net loss of $26,082, after all charges, this being substantially less than losses of the preceding three years. The operating profit in 1933, exclusive of depreciation, was $66,247.

¶Fairbanks-Morse & Co., Chicago, had a net loss in 1933 of $1,147,339 compared with loss of $2,547,231 in 1932.

Iron Ore

LAST year's prices on Lake Superior iron ore were quoted to the Ford Motor Co. on its inquiry for 50,000 tons which called for a response by April 10.

Up to late last week the company had not purchased the ore, and pending this or some other sale of substantial tonnage the open-market price levels for this season cannot be considered as established. Long-term contract prices are based on open-market sales. The circumstances, however, indicate that prices will not be changed. This will make the sixth season they have been continuously in effect.

A shortage of certain grades of iron ore is reported, and it is understood that some producers of steelmaking grades of pig iron would increase their production if they had sufficient material. Although there are more than 20,000,000 tons of ore at lower lake ports and furnaces, stocks have become unbalanced as regards grades, and this factor alone will tend to increase shipments this year.

Vessel charges have not been determined. The lake carriers drafted a code and submitted it to administration officials, but Washington wanted one code to blanket the country's entire navigation system. This code was formulated a week ago, and separate codes covering various territories, such as the Great Lakes now will be prepared.

Lake carriers have announced an advance of 10 per cent in seamen's wages. A similar increase was granted last September. The new rates will cancel the reduction made in 1932, restoring them to the 1929 level. The carriers also have decided to increase the number of men in the crews, depending on the vessel's size. These additions, with higher fuel costs, it is estimated will raise transportation costs this year at least 25 per cent.

Meetings

STEEL CLUB OF PHILADELPHIA will hold its annual outing at Aronimick golf club, near Philadelphia, June 29. A full day's program, with dinner in the evening, is being arranged. The Steel club comprises district representatives of various steel companies throughout the country, and is unique in that it was the first organization of this character to have been formed.

S. A. E. Luncheon at Pittsburgh

Society of Automotive Engineers, Pittsburgh section, will hold a joint luncheon meeting with the Pittsburgh Chamber of Commerce at the latter's auditorium at 12 noon, April 19. Charles E. Wilson, vice president, General Motors Corp., supervising accessory divisions, will speak on the "Automotive Industry as an Important Factor in the Business Activity of the Pittsburgh District."

Steel Foundrymen to Meet

Steel Founders' Society of America will conduct a meeting in Cleveland, April 19-21. Headquarters will be at the Hotel Cleveland.

NRA

TO EXPEDITE the making of decisions, Administrator Hugh S. Johnson last week announced the reorganization of the personal and administrative staffs of NRA. The personal staff, available to him for such special duties as he may assign them, consists of Col. Robert W. Lea, assistant administrator for industry; Edward F. McGrady, assistant administrator for labor; Miss Frances M. Robinson, assistant to the administrator; and Kilbourne K. Johnston, aide to the administrator.

Administrative staff members and their responsibilities are:

Col. G. A. Lynch, administrative officer, who will act on matters not otherwise assigned which do not require the administrator's personal attention, including all matters of office organization and management.

Alvin Brown, review officer, who will review all documents for consistency with approved policy and will forward them with his comments

to the appropriate staff member or division head.

W. A. Harriman, special assistant administrator, who will supervise the selection and appointment of executive personnel of NRA and insure that activities of the industrial divisions are co-ordinated.

Donald Richberg, general counsel.

Leon Henderson, economic adviser.

Still to be named are an assistant administrator who will have supervision over policies governing employment, trade practice and code authority problems, and a director of enforcement.

King Succeeds Whiteside

Harry O. King, since early in July 1933, a deputy administrator, in Division II, has been named to succeed Arthur D. Whiteside as divisional administrator of Division IV in charge of codes for finance, the textile industries and the wholesale and retail trades.

Denies Exemptions on Gear Code

Administrator Johnson has announced his denial of an application by Winfield H. Smith Inc., Concord, N. Y., and Alling-Lander Co., Sodus, N. Y., for an exemption from and a modification of certain provisions of the approved code for the gear manufacturing industry. The order states that the stay heretofore granted these applicants is terminated.

Approves Cost System on Boilers

NRA has approved, effective April 21, principles of cost accounting for the boiler manufacturing industry. The principles approved are those contained in a 75-page pamphlet entitled "A Manual of Standard Accounting and Cost System adopted by the Machinery Builders society."

Steel Plate Fabricators Get Code

A code for the steel plate fabricating industry has been approved, effective April 16. It provides for a basic 40-hour week and fixes minimum wages for factory and construction employes of 40 cents an hour in the North, 30 cents in the South, and 35 cents in the states of Texas and Virginia. The industry now has 9700 employes, an increase of 45 per cent over February, 1933.

Refractory Industry Revises Code

At a public hearing on the code for the refractories industry held last week, amendments were presented by the American Refractories institute designed to increase wages 10 per cent, while reducing hours in the same ratio. Under the proposed amendments, employes engaged in common labor at minimum wage rates would not be permitted to work more than 36 hours per week, averaged over a 30-day period. Other employes would be limited to a maximum of 8 hours in one day and an "average" 40-hour week, with the exception that the limit of 8 hours per day would not apply to the fire clay producers division operating open pit mines or quarries.

Code for Track Equipment

A code for the railroad special track equipment industry has been approved, effective immediately. It provides for a 40-hour, six-day week, with exceptions for watchmen, firemen, engineers and office employes. The minimum hourly rates are 40 cents in the North and 32 cents in five southern states.

Hardware Code Hearing

A public hearing on a proposed supplemental code to the general code for the wholesaling and distributing hardware trade will be held at 10 a.m., April 19, in the Oak room, Raleigh hotel, Washington.

Outlines Requirements for Recovery of Capital Goods Industries

IN AN address on "Essentials of Industrial Recovery," delivered recently before the Economic club of Chicago, George H. Houston, president, Baldwin Locomotive Works and chairman of the NRA capital goods industries committee stressed the belief that no lasting recovery in employment may be expected except as it is initiated and carried out within the field of durable goods, and that no substantial prosperity can return until this objective has been accomplished.

Mr. Houston continued this thesis by pointing out that reduction in unemployment in the capital goods industry has been and is being realized but one-half as rapidly as in the consumers' goods industry. He objected to the opinion that the country was over-developed by stating that "so long as our physical sciences and mechanical arts continue to develop, so long as man has new ideas and wants, so long will we have to continue to build and rebuild the durable equipment of the country."

George H. Houston

"The accumulation of private savings and their flow into investment in durable goods must be continued," said Mr. Houston, "but while the federal government is endeavoring to find ways and means of artificially supplying industry with its capital requirements it is at the same time throttling the flow of private capital into industry through drastic legislation of a regulatory nature."

To establish the underlying conditions necessary before private enterprise will again resume its normal activity, Mr. Houston proposed the following:

1. Amend the securities act of 1933 to simplify the processes involved in the issuance of securities and remove the unwarranted personal liabilities present. Amend the Glass-Steagall act to permit the participation of commercial banks in the underwriting of new securities; and rewrite the proposed national securities exchange act, confining it to the regulation of national securities exchanges and those trading upon them.
2. Organization of the proposed intermediate credit banks for industry.
3. A governmental policy of encouragement to private enterprise.
4. Relief from the radical reforms being thrust upon the country by a small minority.
5. Continuation of the amicable relations between employer and employes based upon good will, mutual confidence and respect. Enactment of the Wagner bill would prevent this, said Mr. Houston.
6. Emphasis upon recovery instead of immediate reform; the latter may be carried out subsequently in an orderly and considered manner.
7. Recognition that the opportunity for recovery in employment lies primarily in the capital goods industry.
8. Realization that prosperity lies in the production of goods and not in the curtailment of their production. Costs must not rise too rapidly; a proper balance must be maintained to facilitate the free exchange of goods produced by different portions of the population.

WINDOWS OF WASHINGTON

WASHINGTON

ACTION of the administration in the days following President Roosevelt's return from vacation is being watched closely for signs indicating whether his next move will be to the right or to the left.

Many well informed Washingtonians are confident that he will lean more and more toward the conservative side. One sound observer puts it this way: "The administration during the past few weeks has made a strong return to Wilsonian principles and is increasingly relying upon men of the Wilsonian school."

Business men in Washington are elated over what appears to be a turn toward sanity. They feel that the more conservative tendency of the administration, which first manifested itself when the President made his famous utterance in settlement of the automobile strike, has spread further. Apparently the days of radical legislation are over. The winter of discontent appears to be at an end.

When the history of this administration comes to be written, the automobile settlement may loom up as the rock on which the wave of radicalism split and spent itself. Congress, labor and many administration officials reflect the effects of this defection from the left. They believe that the forces of the left have been scattered and disorganized.

The strong opposition of industry throughout the country to proposed radical legislation has unmistakably impressed both houses of congress. The remarkable showing of the steel industry—both employers and employes—against the Wagner bill left the senate committee on education and labor in a daze. That committee has held no further meetings and is not expected to have one until about the middle of this week. It is expected the committee will report out some kind of a bill, but it is apparent that it has lost a good deal of heart in this work. Failure to report out the Wagner bill in some form would not be regarded as a wise move in view of the desire to keep organized labor from getting too much soured prior to the coming election in Fall.

Representative Connery who is behind the companion bill in the house has decided not to do anything further until the senate committee acts.

And the bill for regulating stock exchanges, which the durable goods industry, along with the country's financial interests, has been opposing, has been softened day by day and now gives promise of ultimately developing into a satisfactory measure.

If the temper continues as at present, business and industry have little reason for fears of what congress may do during the remainder of the session. It is becoming more likely that adjournment will be taken by June 1 and possibly as early as May 15. Congressmen want to get back home—many of them come up for re-election in the Fall, and they want to mend their fences. With busines recovery apparently assured, they now are disposed to go conservative.

It, of course, goes without saying that the President is just as much interested in the results of the election as any congressman. So, whatever, may be the course after the election, a less radical policy than before is expected to be observed for at least some months to come.

Conservative Tone Stronger

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NRA Is Outfitted in Khaki

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Reorganize Railroad P.A.'s?

WASHINGTON is not entirely surprised at the statement by General Johnson, on his way to meet the President at Miami, that he approved of the Wagner bill, aside from the provision preventing employers from "initiating" company unions. "There will have to be a court of review, which is the function of the Wagner set-up," said the general. As a matter of fact, the general now is more interested in keeping congress from making any amendments to the industrial recovery act than in anything else. It is thought here that his virtual endorsement of a modified Wagner bill springs from desire to placate certain senate leaders, and at least make amends for his failure to appear personally before the senate committee.

Before leaving Washington, the NRA administrator made important changes in this organization. The intention is to eliminate certain bottlenecks which slowed up action in NRA. It now is the nearest thing to a military organization in Washington aside from the army. Responsibility for making decisions heretofore made only by the general himself has been delegated to subordinates. The new administrative officer, Col. G. A. Lynch, who has a 3-month leave of absence from the army, and who recently was referred to by General Johnson as the "ablest thinker in the army," has the power to approve codes. The other members of the reorganized administrative staff are Alvin Brown, W. A. Harriman, Donald Richberg, Leon Henderson, George Buckley and an additional member not yet definitely appointed.

But the general continues to reserve to himself all matters requiring decisions as to policy.

COMING under this head is the reply which NRA will make to the federal trade commission's report on steel prices. Involving as this does the reconsideration of open prices, basing points and other trade practices, it is believed here that this whole subject was one of the most important matters which the general discussed with the President last week.

The matter of open prices under NRA codes is considered one which

will have the attention of the entire cabinet as soon as the President cleans up his desk following his vacation in Southern waters. Secretary Roper has stated that a report will be made "in a few days" by the committee of four cabinet members designated by the President to investigate open prices. It is likely, therefore, that General Johnson's report may follow a Presidential ruling on this subject.

That the steel industry will be asked to shorten working hours following its recent advance in pay appears unlikely. It is thoroughly understood in NRA that whereas the steel code allows a 40-hour work week, actually the men are averaging about 30 hours per week.

NRA has put an edge on its axe for code violators. Instructions have been issued to all field agencies and code authorities under NRA, to refer directly to United States district attorneys all cases of code violations, following failure of attempts to persuade the violators to desist from illegal practices. Experience proves, however, that most of these violators can be brought into line without going to the extreme of taking court action.

Leading members of the administration are agog over the so-called Walker-Riefler plan for stimulating the construction and durable goods industries. It is expected the President will make an important announcement on this matter shortly. Administration officials go so far as to predict this movement will practically replace CWA, but with expenditure of private rather than government funds. Government guarantees of mortgages and the granting of long-term credit to industry are among the features embodied in this plan.

GREAT changes in railroad purchasing methods may result from a study just launched by American Railway association at the request of Railroad Co-ordinator Eastman. Prices paid by different railroads for materials will be compared. The adherence which the roads give to ARA standards will be checked. Present standards will be challenged and, if advisable, will be changed.

From a steel standpoint, one of the most important features of this study will be a thorough examination of practices coming under the head of reciprocal buying. There are cases where railroads buy steel from a distant mill, so that they or their feeder lines will enjoy a long haul, at the expense of the steel company. It is said that railroads in some cases make use of such transactions in trading business with each other.

Cases to receive attention will include those where steel companies producing a full line of railroad materials get the bulk of the business. It is felt in some quarters that smaller companies manufacturing only one or a few railroad products are ignored in the lack of competition resulting from reciprocal dealing.

The size of railroad orders may be increased so as to save money by eliminating quantity extras. It is possible that the tendency to centralize railroad purchases may be accelerated. The move by the Van Sweringen interests in combining purchasing departments of the Chesapeake & Ohio, Nickel Plate and Pere Marquette, with headquarters in Cleveland, is considered in some quarters here as worthy of study.

This study will have its inception with a special committee of ARA to sit in Chicago. It comprises: Chairman, F. D. Reed, vice president, Rock Island; A. C. Mann, vice president, Illinois Central; C. E. Walsh, purchasing agent, Pennsylvania. This committee will obtain from the Chicago territory railroads carbon copies of all their purchase orders. After a trial period, the study either will be discontinued or extended to other districts.

CONTRACTORS or suppliers of various materials to different departments of the government have complained loudly over the effect the New Deal has had in increasing their costs. It is said that certain steel companies are under contract to deliver steel which costs them $10 to $12 a ton more to produce than at the time they booked the business. The departments involved have pointed out that nothing can be done for the contractors excepting as a result of an act of congress.

It is of much interest to note, therefore, that Representative Summers of Texas has introduced a measure by which the President would appoint a special commission to examine contracts placed prior to NIRA, with power to increase the original contract prices by a maximum of 7 per cent. It is understood here that the navy department and the bureau of reclamation consider that some such a move would be a fair one. Even should nothing come of the Summers bill, it is felt here that eventually there will be an organization something like the court of claims created after the world war, to settle complaints arising from the President's effort, through NIRA and NRA, to increase costs and selling prices.

The expected revival of trade between this country and Russia has not yet developed owing to the administration policy of making no loans to countries ignoring their indebtedness to us. Hence the new Export-Import bank, fully capitalized for financing trade with the soviet union, is completely inactive and doubtless will continue so until Ambassador William C. Bullitt effects a debt settlement.

AT CODE hearings the representatives of labor are showing a much less aggressive spirit than a few months back. At one recent hearing a labor representative wanted assurances from the manufacturers that the industry would do nothing that would have the effect of increasing production per man. The manufacturers declined to give such assurance and the request was dropped without argument.

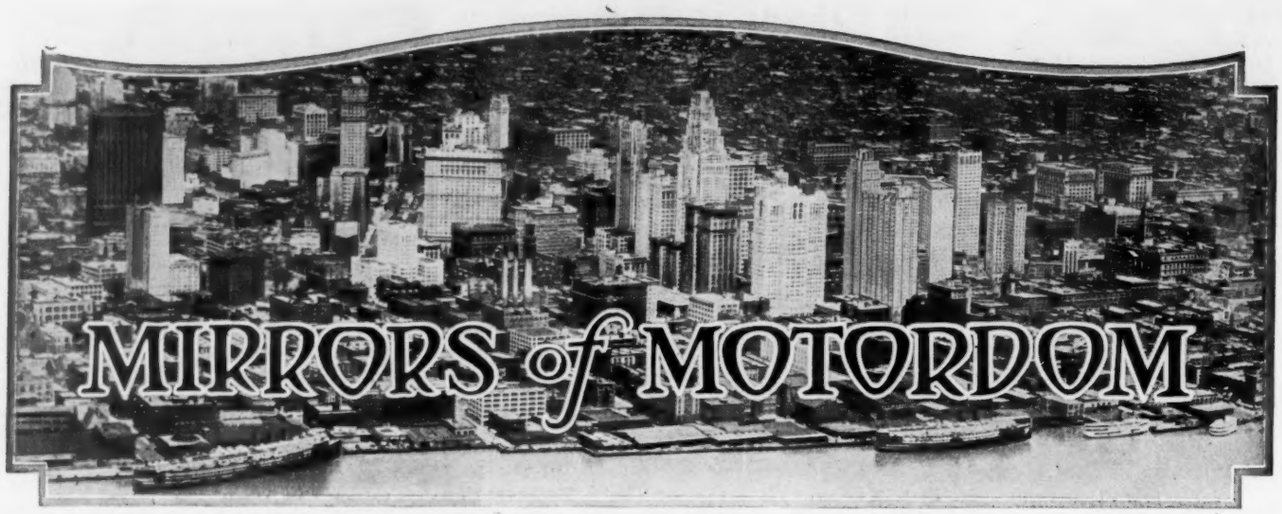
An interesting case is reported here where a manufacturer designed a certain part for a department of the government and later discovered that an order, based on this design, had been placed without the originator of the design being given a chance to bid. The designer promptly applied for patents covering this design and thus has protected his interests in this direction for the future. This is a fair illustration of the fact that in dealing with so impersonal an entity as a large government department, it is necessary that the co-operating party protect himself.

A plan to retire the LEVIATHAN and replace her by a modern cabin ship of the Manhattan-Washington type, is being considered by the United States shipping board bureau of the department of commerce. A decision in this proposal, calling for government aid under the Jones-White law, is expected to be made soon.

Plan To Light Charcoal Iron Stacks in Michigan

Encouraged by the increasing volume of new business, operators are preparing to light several Michigan charcoal blast furnaces. Stocks of pig iron at charcoal stacks have become depleted through recent heavy sales, and one important producer of Lake Superior charcoal iron advises that in March it booked the largest volume of business that it has taken in any one month for the past nine years.

The Antrim Iron Co. expects to put its stack at Mancelona, Mich., into blast between April 15 and 20. Delta Chemical & Iron Co. is planning to start its furnace at Wells, Mich., near Escanaba, in about two weeks. The Newberry Lumber & Chemical Co. expects to get its furnace at Newberry, Mich., in blast again about June 1. The Cleveland-Cliffs Iron Co. has not yet decided when its stack at Marquette, Mich., will blow in.



Unions Hit at Parts Plants

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Labor Board Lacking Punch

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Price Rises Being Absorbed

DETROIT

STRIKES are said to be a sure sign of returning prosperity. Nevertheless, Detroit would far rather have the outside world accept the fact that prosperity has been here for some time—for the automobile industry at least—and have done with labor's pot-shooting.

Last week it was no satisfaction to already-graying production managers in the auto plants to see assemblies crippled almost overnight, as Hudson's was by the Motor Products Corp. strike. Of itself, just the routine problem of automobile production this winter and spring has been difficult enough, without the additional complications of labor strife.

True, the Hudson suspension last week turned out to be just a matter of hours, and luckily not longer. Motor Products' employes were soothed with a 10 per cent wage increase, but guerilla warfare of this nature does not make for restful sleep. Desultory sniping, with labor's foremost offensive the picking-off of vulnerable parts' plants, is nerve wracking even if it isn't deadly.

Detroit is well aware of the funnel-like character of some parts plants and their consequent vulnerability. Organized labor unions have been careful to deal their blows where they will do the most good. Since the establishment of the auto labor board, labor hasn't pulled its punches.

BUT, if the automobile industry's management is on the spot, it doesn't intend warming that location very long. What the industry's management is doing about the near future is not only precautionary but sound business.

In retooling, for example, Detroit understands that this coming fall's programs will come out two months, and maybe more, before the usual October schedule. Tool and die work will be well distributed, bearing out last year's trend. And, in cases, this business will be brokeraged, that is, let out to suppliers through a third party, both to obviate delays and to guard secrecy. Chrysler tried this practice first last year on die work for the airflows when a broker outside of Detroit sublet most of the job's diework, kept competitors guessing, and at the same time built protection on deliveries.

Unfortunately, the new labor board started off with high hopes but with two called strikes on it, for out of its first case at Nash nothing came but an impasse and a loss of face. The sore spot there has been the Kenosha, Wis., division and the board's neutral member, Dr. Leo Wolman, himself admitted, after efforts at mediation were unavailing, "it looks like a last ditch fight to me"—referring, of course, to the differences between employer and employe. On Friday, prospect for settling the Nash and Seaman strikes appeared more promising.

BY SUCH as the Nash incident, plus a disturbing situation at Fisher Body's Cleveland plant, and elsewhere, did many begin to question last week the true jurisdiction of the automobile labor board. Combing the official statement of President Roosevelt when the auto labor board was formed, scrutinizers found that there is actually nothing which gives this board any authority over wages and hours. What it does have is ample power to adjust discrimination and determine representation.

Conflicting demands of nonaffiliated unions tend to complicate the automotive labor situation. For example, the tool and die union and its 18,000 members who are enrolled under the name of the Mechanics Educational Society of America, will have none of the automobile labor board and is in turn competitive with the American Federation of Labor, especially if the tool and die union is to enroll unskilled members.

Matthew Smith, native of England and leader of the Mechanics Educational Society of America, brought his own group's conditions to a head last week by demanding for his followers not only a 20 per cent wage increase, but a 36-hour week, time and half for overtime over seven hours daily, 24 hours notice by the employer to the union before laying off an individual, yet only the assurance that acceptance of this ultimatum would be effective until July 15.

Sporadic strikes continued through the week at Campbell, Wyant & Cannon Co.'s foundry at Muskegon, at Bingham Stamping at Toledo and at Detroit-Michigan Stove Co. but if all the names of plants were mentioned where workers in some form or another had made wage or hour demands the list would be long.

"Highly unsettled" would have been the consensus of Detroit's idea on the local labor situation last week. As if troubles were not enough, there has been considerable talk among union labor representatives—who possibly feel they were sold out when the automobile labor board was appointed three weeks ago—that now Richard Byrd would be withdrawn from the board because the procedure adopted by Dr. Wolman and Nicholas Kelley, the other two members, was slowing up the important work and swift action that President Roosevelt had promised. Such a withdrawal would dissolve the board.

APRIL production figures shed some light on the trend through May. Barring the unforeseen, Ford should make the most progress.

The River Rouge maker, after un-

doubtedly recording a higher April production than March, may make as high as 90,000 to 100,000 cars next month. Unquestionably, Ford played the right card in standing pat on price and to him has accrued an incalculable measure of favor. On the other hand, whether Fordson's assemblies can catch Chevrolet and its swift rate of 100,000 or so units per month, should be proved in May. So far, demand for Chevrolets has satisfactorily absorbed the price advance; likewise has Plymouth's.

So fully engaged is stamping capacity of the mid-West on automotive work, that several distant shops in the East have recently taken on some Detroit stamping contracts . . . . A proxy battle is going on at Reo between constituents of R. H. Scott, president, and R. E. Olds, chairman of the board. Showdown is set for April 17, the annual stockholders' meeting . . . . Scrap has started to move again by water out of Detroit, the HENRY CORT having carried two cargoes in a week, one to Lorain, O., and the other to Cleveland . . . . Recently, at least one other large body plant has taken to the idea that next year entire body shells will be stamped out of only two sheets of steel. (See STEEL, March 5, p. 18).

New Car Truck Designed

An entirely new type of freight car truck, insuring easier and smoother riding and better protection to lading, has been designed by the Pennsylvania railroad and will be applied for the first time on 250 steel box cars now being built by the railroad in its shops.

Improved riding qualities of the new truck are obtained primarily through introduction of a new spring arrangement, embodying the use of elliptical springs in addition to the usual spiral springs.

Freight cars moving over the road develop a bouncing motion, railroad officials say, which causes rough riding. In the new truck, the interposition of elliptical springs between the truck bolsters and side frames eliminates these undesirable vertical harmonics, as they are termed, and provides much easier and smoother riding for car and lading. The springs have the effect of snubbers in controlling vertical motion.

The new truck is expected to reduce loss and damage to freight in transit materially, cutting railroad operating costs and saving patrons inconvenience due to damaged shipments.

The recently developed elliptical springs for this truck are being made in the Altoona shops of the Pennsylvania railroad and the trucks themselves will be assembled and applied to the cars in Altoona.

Industrial Men in Day's News

Joseph C. Eckel, Assistant General Manager of Sales, American Sheet & Tin Plate Co.

Twenty-five years of continuous service with this company have enriched his industrial experience.

Starting in the order department, he later was active in inspection and metallurgical duties.

Long a resident of Pittsburgh, he now specializes in sales engineering and promotional work.

JOSEPH C. ECKEL, for 25 years continuously employed by the American Sheet & Tin Plate Co., has been appointed assistant general manager of sales with headquarters at Pittsburgh.

After receiving his education at Pittsburgh academy and Carnegie Institute of Technology, Mr. Eckel entered the employ of the American company in 1909 in the order department. Later he was identified with the inspection and metallurgical departments but during recent years his efforts have been confined to special sales engineering and promotional work.

During his entire association with the company he has been in the Pittsburgh office and in his new capacity he is assistant to F. M. Fuller, general manager of sales.

As recently reported in STEEL, George McLaughlin also has been appointed an assistant general manager of sales for the company, having been brought in from the Cincinnati office.

Mr. Eckel, a resident of Pittsburgh, is a member of the American Society for Testing Materials and the American Ceramic society.

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Leslie D. Frobes has been appointed sales and district representative for the Kansas City, Mo., territory by the Colorado Fuel & Iron Co., Denver. For many years he has been associated with the brass goods and nonferrous industry in that territory.

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Andrew B. Holmstrom has been appointed works manager of the Norton Grinding Wheel Co. Ltd., Welwyn Garden City, Hertfordshire, England, affiliated with the Norton Co., Worcester, Mass. He succeeds Frank M. Ryan who has been appointed assistant to Herbert A. Stanton, the latter now European manager of Norton interests with offices in London. Mr. Holmstrom has been associated with the Norton Co. for over 15 years, mainly in this country.

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A. C. Richardson has been appointed to the technical staff of Battelle Memorial institute, Columbus, O. He was formerly with the bureau of mines at its southern experiment station in Tuscaloosa, Ala., where he was employed in coal cleaning and ore dressing investigations.

Chester R. Austin likewise has been appointed to the institute's technical staff. Formerly he was associated with the Roseville experiment station of Ohio State university, Columbus, and later was compressor engineer with the Ohio Fuel Gas Co., Cambridge, O., He will be active on a special refractory project at Battelle.

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H. Stanley Rogers has been elected president of the American Shear Knife Co., Homestead, Pa., manufacturer of solid steel shear knives and steel mill forgings. He has been active in the steel business for the past 20 years, at one time being associated with Jones & Laughlin Steel Corp., and for the past 11 years with

Heppenstall Co., where he was a director and manager of plant operation.

S. C. Stiner is now a sales representative for the American company, having formerly been with Heppenstall in a similar capacity.

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C. E. Walsh has been appointed general purchasing agent of the Pennsylvania railroad. He will be succeeded as purchasing agent by E. J. Lamneck, formerly in charge of purchasing of fuel.

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Frank Wheatley, president, Wheatley Bros. Foundry & Machine Works, operating plants in Tulsa, Okla., and Kansas City, Mo., has moved his headquarters from the latter city to Tulsa, to take active charge of the company.

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William B. Turner, has been made general manager of production and sales of the fireproof building materials division of the Milcor Steel Co., Milwaukee.

C. C. Wollaeger has been appointed assistant manager.

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Carl S. Standard, treasurer, Hauser-Standard Tank Co., Cincinnati, has been given the additional office of vice president, succeeding the late Stephen J. Hauser, whose death was noted in the March 19 issue of STEEL.

Frank Bailey has been named sales manager of the company.

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Carl H. Anderson has been elected president and general manager of the Rich Mfg. Co. Ltd., Los Angeles, which recently took over assets of United States Foundry Ltd. and the Fernholtz Machinery Co., also of Los Angeles. Other officers of the Rich company include: Vice president, L. W. Kirkpatrick; secretary and treasurer, A. C. Delevanti; and sales manager, Edward F. Alt.

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W. B. Breyley has been elected president and general manager of the General Drop Forge Co., Buffalo. He was formerly vice president.

M. H. Latta of Philadelphia has been named vice president.

S. J. Marshall, formerly president of the Endicott Forging & Mfg. Co. Inc., Endicott, N. Y., has been named sales manager of the General company.

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A. L. Humphrey, chairman of the board, Westinghouse Air Brake Co., Wilmerding, Pa., and H. S. Wherrett, president, Pittsburgh Plate Glass Co., have been elected directors of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

George M. Verity, chairman of the American Rolling Mill Co., Middletown, O., is one of five former directors re-elected.

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Robert E. W. Harrison, from 1926 to 1932 with the Cincinnati Milling Machine Co. and Cincinnati Grinders Inc., Cincinnati, and at one time sales engineering director for both companies, has been appointed chief of the industrial machinery division of the bureau of foreign and domestic commerce, Washington, succeeding W. H. Rastall. The latter has been named to an executive position with the capital goods section, division of research and planning, of NRA. Since 1932, Mr. Harrison has carried on a consulting engineering practice on problems of design, management and marketing.

Harvey Dieterich

Ainslie Y. Sawyer

Mr. Dieterich, as noted in STEEL for March 26, has been made assistant vice president in charge of operations of the structural and special order department in Chicago of Joseph T. Ryerson & Son Inc. Mr. Sawyer has been named assistant general manager of sales, specializing in the field promotion of the company's products

Died:

LUTHER L. KNOX, 63, nationally known in the steel industry for his numerous patents on water-cooling steel furnaces, in Pittsburgh, April 6. He was formerly vice president and director of the Blaw-Knox Steel Co., which 15 years ago was formed by a merger of the Knox Pressed & Welded Steel Co. and the Blaw Construction Co. Recently, he had been affiliated with the Pressed Steel Car Co. and was active in the design of a new-type door for open-hearth furnaces. He was a member of the American Iron and Steel institute and other associations.

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William M. Hoke, 67, vice president and treasurer of the Connors Steel Co., Birmingham, Ala., in that city, April 4.

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A. P. Lunberg, 43, construction engineer for Lackawanna Steel Construction Corp., Buffalo, in Dover, N. H., April 10.

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Patrick H. Leen, 73, president and treasurer of the Fewless-Leen Brass & Iron Co., Cincinnati, at his home there, April 8.

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James Robertson, 51, a foreman in the open-hearth department of the Edgar Thomson works of Carnegie Steel Co., in Pittsburgh, April 8.

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Raymond C. Suckling, 43, vice president, secretary and treasurer of the Standard Steel Spring Co., Coraopolis, Pa., in Coraopolis, April 11, after a four-month illness.

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George C. Dauble, 85, general superintendent of the Advance Stove Works, Evansville, Ind., and former vice president and general manager of this company, in Evansville recently.

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Noble C. Harrison, for 32 years associated with the sales department of John A. Roebling's Sons Co., Trenton, N. J., in Philadelphia, April 4. He was widely known in the wire rope industry.

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John B. Nessle, 64, freight traffic manager of the Pittsburgh & Lake Erie railroad, in Pittsburgh, April 7. He was a director of the Pittsburgh chamber of commerce and a member of Traffic Club of Pittsburgh.

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Franklin F. Chandler, 57, since 1923 associated with Ross Gear & Tool Co., Lafayette, Ind., and latterly vice president in charge of sales, in Lafayette, April 6. From 1900 to 1923 he was manager of sales for Chandler & Taylor Co., Indianapolis.

Code Defines Machinery and Allied Products Industry

UNLIKE most of the NRA codes approved thus far, the code of fair competition for the machinery and allied products industry is a basic, general pact for 39 subdivisional industrial groups—each of which may file supplementary codes.

The general code was approved March 17, 1934, and became effective March 28. President Roosevelt approved it "on condition that each of the trade associations representing the 39 subdivisions of this code shall amend its constitution, by-laws and/or articles of incorporation or association to the satisfaction of the administrator within 30 days after the effective date of this code and that the code authority constituted under the code and the code authority under the code of fair competition for the 'automotive parts and equipment industry' study the definitions contained in the two codes referred to, and within 60 days from the effective date of this code recommend to the administrator such changes in said definitions as will eliminate any overlapping therein."

In recommending approval of the code, General Johnson stated that the trade associations representing the 39 subdivisions are "representative of approximately 88 per cent of the dollar volume of business coming within the definition of this industry."

Forty-hour Week Specified

Article I in the code provides the right of employers in subdivisions of the industry to apply for a supplemental code which shall be applicable solely to that subdivision, all provisions of the main code being included by reference.

A maximum work-week of 40 hours is specified except for executives, employes receiving $35 or more per week, watchmen, who are limited to 56 hours, and power plant engineers and firemen, who are limited to 45 hours. Overtime provisions allow 1½ times the regular rate and detail limits for such work.

Hourly wage rates, designated in article IV, differ with the population of the immediate vicinity. Forty cents is set for cities of 50,000 or more; 38c per hour in cities less than 50,000 but more than 10,000; and 36c in those less than 10,000. Southern states are excepted, 32c per hour being set as the minimum wage. With certain other exceptions, $15 is specified as the minimum wage per week. Female employes are guaranteed the same rate of pay as men in work substantially the same, with a further provision that they shall be paid not less than 87½ per cent the proper rate for the locality.

A temporary basic code authority is constituted in article VI for a 60 day period, at the end of which the permanent code authority will be elected. This article sets forth further details of administration and penalties.

Article VII stipulates the procedure that a group of employers, representative of machinery or allied products not defined in this code, may take to become an additional subdivision.

That part of Article II of the code, which defines the 39 subdivisions of the "machinery and allied products industry," is presented herewith in full:

1. Air Filter Subdivision

Means the manufacture for sale of equipment used solely for the cleaning of air and other gases, and parts thereof except for use in aeroplanes, automobiles, trucks or tractors and includes all those engaged in such manufacture for sale.

2. Bakery Equipment Manufacturing Subdivision

Means the manufacture for sale of bakery machinery, ovens, and general equipment and appliances, accessories thereto and parts thereof, and includes all those engaged in such manufacture for sale, excepting, however, those who are engaged in the manufacture of equipment, appliances and accessories and parts therefor coming within the definition of another industry as defined in an approved code for such other industry and who are not otherwise employers within the scope of the definition of this Subdivision.

3. Beater and Jordan and Allied Equipment Subdivision

Means the manufacture for sale of beaters and jordans and allied equipment and parts thereof, and includes all those engaged in such manufacture for sale.

4. Caster and Floor Truck Manufacturing Subdivision

Means the manufacture for sale of casters of all descriptions, including furniture, metal bed, washing machine, hospital, truck casters, and miscellaneous casters, and floor protective devices, commonly called glides, slides and rests; hand propelled floor trucks of all descriptions, trailers (other than highway trailers), barrel skids and parts of all the foregoing products, and all articles and devices kindred or incident to the caster and/or floor truck business, and includes all those engaged in such manufacture for sale.

5. Cereal Machinery Subdivision

Means the engineering, designing, manufacturing and/or importing and assembling for sale of machinery including spare, repair and replacement parts thereof; this includes reduction, cleaning, roasting, drying, cooling, separating, mixing and flaking machinery as used in the manufacture and processing of cereals, seeds and nuts and/or their by-products and includes supplies and/or equipment directly or indirectly incident thereto and also includes grinding and corrugating of mill rolls (excluding machinery and/or equipment for extracting vegetable oils, hammer mills, machinery as sold for use on farms, machinery and/or equipment or parts therefor having a general application and use for purposes other than the uses hereinabove enumerated) and includes all persons so engaged.

6. Concrete Mixer Subdivision

Means the manufacture for sale of concrete mixers of the building mixer, paving mixer, truck mixer and agitator type, and parts thereof, and includes all those engaged in such manufacture for sale.

7. Contractors' Pump Subdivision

Means the manufacture for sale of dewatering and pressure pumps of the following types: diaphragm, standard centrifugal up to 8 inches in size and self priming centrifugal up to 6 inches in size for dewatering purposes; plunger and piston type trench pumps; contractors' water supply pumps, and road pumps and parts thereof, intended for use by contractors in the construction industry, and includes all those engaged in such manufacture for sale.

8. Conveyor and Material Preparation Equipment Manufacturing Subdivision

Means the designing, manufacturing, and assembling for sale, and installing when required, of equipment (stationary or portable), for handling, transporting and elevating mechanically, materials and articles (either packaged or loose), and also equipment for cleaning, preparing and processing bulk materials while being mechanically handled (excepting, however, machinery and/or equipment wherein a conveyor or material preparation mechanism is an integral part thereof, and one or more processes or functions are performed within such machinery and/or equipment for the processing of food products or seeds), and includes all persons so engaged.

In connection with the designing, manufacturing, assembling, and installing of such equipment, the Subdivision uses only the following mechanisms, or one or more of them: chains, belts and cables with or without drag scrapers; cleats, trolleys and buckets; gravity chutes; power driven and gravity rollers, wheels and balls; belt idlers; screw conveyors; screens and mechanical cleaning devices; and mechanisms and supports required for their operation. The Subdivision shall include the designing, manufacturing, assembling and installing of power driven and gravity rollers and wheels, belt idlers, screw conveyors, screens and mechanical cleaning devices; provided that it shall not include the designing and/or manufacturing for sale of other mechanisms, although such mechanisms are used as parts of the equipment designed, manufactured and assembled by it for sale.

9. Diamond Core Drill Manufacturing Subdivision

Means the manufacture for sale of diamond core drills, supplies, fittings, equipment, and parts thereof, and includes all those engaged in such manufacture for sale.

10. Diesel Engine Manufacturing Subdivision

Means the manufacture for sale of

diesel engines and/or parts thereof, except diesel engines used (1) in, and for the propulsion of, aeroplanes, automobiles, trucks or tractors, and (2) in, and for the operation of, portable air compressors, and includes all those engaged in such manufacture for sale.

11. Envelope Machine Manufacturing Subdivision

Means the manufacture for sale of machinery and/or parts thereof for use in the manufacture and/or production of envelopes of all kinds, including the erecting, designing, servicing, maintenance, and repair of such machinery and/or parts thereof, and includes all those engaged in such manufacture for sale.

12. Hair Clipper Manufacturing Subdivision

Means the manufacture for sale of hand or electrically or other power-operated hair clippers for human or animal use, products directly or indirectly incident thereto, appliances and parts thereof, and includes all those engaged in such manufacture for sale.

13. Hoist Builders Subdivision

Means the design, manufacture, contracting for and/or subletting the manufacturing for the sale of hoists operated by electricity, gas, oil, air or steam, for hoisting or hauling material or men and for all industrial uses in which such type of hoists, commonly known as mine hoists are applicable, including spare, repair and replacement parts thereof, and includes all those so engaged; provided that the Subdivision shall not include those types of hoists, including spare, repair or replacement parts thereof, commonly known as contractors hoists, slusher hoists, direct lift hoists, simple cylinder hoists, monorail hoists, trolley hoists, body and dump truck hoists.

14. Hoisting Engine Manufacturing Subdivision

Means the manufacture for sale of power-operated hoisting or winding engines such as are used in construction work, sand and gravel operations, logging, and dredging, and special modifications thereof, including accessory equipment used therewith such as derricks, whirlers, and cableways, and spare, repair and replacement parts thereof, but not including the type commonly known as mine hoists, and includes all those engaged in such manufacture for sale.

15. Hydraulic Machinery Subdivision

Means the manufacture for sale, erecting, and selling of hydraulic machinery of all kinds and parts thereof, whether using water or any other liquid, including specifically but without in any way limiting the generality of the foregoing, hydraulic machines and presses, hydraulic testing machines (made to special order), hydraulic accumulators, and also other accessories such as pumps, valves, and fittings and parts thereof incident to the operation of such hydraulic equipment. It excludes, however, prime movers such as turbines, water wheels, and their accessory equipment, hydraulic brakes and/or parts therefor, hydraulic shock absorbers, hydraulic bumpers and hydraulic dump trucks. It includes all those engaged in such manufacture for sale.

16. Jack Manufacturing Subdivision

Means the manufacture for sale of jacks and parts thereof used generally in the construction, railroad, mining, and general industrial field, exclusive of automotive jacks, and includes all those engaged in such manufacture for sale.

17. Kiln, Cooler, and Dryer Manufacturing Subdivision

Means the design, manufacture, contracting for or subletting the manufacturing for the sale of kilns, coolers, and dryers and accessory equipment for the manufacture of cement and lime, and for use in all mineral, metallurgical, and chemical processes, including spare, repair and replacement parts thereof, and includes all those so engaged.

18. Locomotive Manufacturing Subdivision

Means the building and/or manufacturing for sale and selling of locomotives of more than 600 horsepower capacity per locomotive used for tractive power on railroads and/or finished and semifinished component, repair and replacement parts thereof and/or therefor, by builders of locomotive and/or their affiliated companies; provided, however, that locomotives propelled by electric motors (including finished and/or semifinished component, repair and replacement parts thereof and/or therefor and used therein) may be built and/or manufactured for sale and sold either by members of this subdivision under this code or by members of the "electrical manufacturing industry" under its code. Locomotives of more than 600 horsepower capacity but not to exceed 1200 horsepower capacity and/or finished and semifinished component, repair and replacement parts thereof and/or therefor may be built and/or manufactured for sale and sold by the small locomotive subdivision under this code. "Horsepower" means the figure arrived at by multiplying tractive effort (taken at that speed at which the maximum horsepower will be produced) by the speed in miles per hour and dividing that result by 375. The term "affiliated company" as used in this paragraph means a company whose relations to another company are such that either one has, directly or indirectly, a substantial stock interest in the other, or that a third company has, directly, or indirectly a substantial stock interest in both; provided, however, that in the event of a dispute or disagreement regarding the term "affiliated company" as used herein, such dispute or disagreement shall be referred for decision to an arbitration committee, elected or appointed by a fair method of selection. Should any member of this subdivision desire to appeal from the decision of said arbitration committee, such member may appeal direct to the administrator, whose decision in the matter shall be final.

19. Mechanical Lubricator Subdivision

Means the manufacture or assembly for sale of power-driven force-feed lubricators for cylinders and bearings of diesel engines and other internal combustion engines; for cylinders and bearings of steam engines; for cylinders and bearings of all types of compressors; for automatic lubrication of all types of machinery requiring lubricants to be fed to moving parts; and parts thereof, and includes all those engaged in such manufacture or assembly for sale. It does not include force-feed lubricators for steam railway locomotives or pressure oiling systems for automotive vehicles or force-feed lubricators when manufactured as part of another product by the manufacturers of such other products. Employers otherwise engaged in the "farm equipment industry" may manufacture for sale and sell mechanical lubricators as used or sold in connection with trucks and tractors, under the provisions of the code of the "farm equipment industry" and not under the provisions of this code.

20. Oil Field Pumping Engine Manufacturing Subdivison

Means the manufacture for sale of internal combustion engines of the slow-speed, stationary, oil-well pumping type, using natural gas or oil for fuel, accessories thereto and parts thereof, and includes all those engaged in such manufacture for sale.

21. Power Transmission Subdivision

Means the manufacture for the sale of flat belt pulleys, rope sheaves, couplings, collars, hangers, pillow blocks, journal boxes, clutches and other incidental machinery and appliances used in the transmission of power, but exclusive of shafting, multiple V-belt drives, belting, cut gears, cut tooth and cast tooth sprockets, chains, speed reducers, and automotive parts, and parts thereof, and includes all those engaged in such manufacture for sale. Employers otherwise engaged in the "farm equipment industry" may manufacture for sale and sell power takeoff equipment used in connection with tractors and gear reduction devices for power takeoff for farming machinery, under the provisions of the code of the "farm equipment industry" and not under the provisions of this code.

22. Pulverizing Machinery and Equipment Subdivision

Means the design, manufacture, contracting for or subletting the manufacturing for the sale of ball, tube, roller and attrition types of pulverizing machines, air separators or classifiers of dry materials, and auxiliary equipment including spare, repair, and replacement parts thereof, and includes all those so engaged; provided that the subdivision shall not include fuel-pulverizing equipment or spare, repair or replacement parts thereof. Employers otherwise engaged in the "farm equipment industry" may manufacture for sale and sell hammer mills, feed grinders and similar equipment for use on farms, under the code of the "farm equipment industry" and not under the provisions of this code.

23. Railway and Industrial Spring Manufacturing Subdivision

Means and includes only the business of producing and selling hot formed helical, elliptical, and special springs and/or pressed steel journal box lids and/or pressed steel spring plates.

24. Railway Appliance Manufacturing Subdivision

Means the manufacture for sale of railway hand cars, push cars, velocipede cars, motor cars and special appliances thereof, locomotive water cranes and parts thereof, and includes all those engaged in such manufacture for sale.

25. Reduction Machinery Subdivision

Means the manufacture for sale of centrifugal impact crushers, generally known as hammermills and ring mills; disintegrators of the bar cage type; gravity impact crushers, generally known as Bradford breakers and cleaners; rotary pot crushers; pick and needle breakers; single and double roll crushers, for primary, secondary and fine reductions, and auxiliary equipment, including rotary drum type dry mixers (excluding concrete mixers, and mixers for cereals, seeds and nuts) and including spare, repair and replacement parts thereof, and includes all those engaged in such manufacture for sale. Employers otherwise engaged in the "farm equipment industry" may manufacture for sale and sell reduction machinery for processing grains and fodder on the farm under the provisions of the code

of the "farm equipment industry" and not under the provisions of this Code.

26. Refrigerating Machinery Subdivision

Means the engineering, design, and production of commercial and industrial ice making and refrigerating machinery and equipment incidental thereto. It is expressly stated for the purposes of this Code that it is to apply to the engineering, design, manufacture, and sale, as well as erection and/or installation of such machinery and equipment incidental thereto. Any work or process incidental to and carried on by an employer at his plant or elsewhere as a part of the manufacture of any product of the subdivision shall be governed by the provisions of this code rather than of any other code.

27. Rock and Ore Crusher Subdivision

Means the design, manufacture, contracting for or subletting the manufacturing for the sale of rock, gravel, and ore crushers for coarse and secondary reduction and includes spare, repair and replacement parts thereof, and includes screening and washing machinery, the sale (but not the manufacture) of conveying machinery, and any other accessory equipment and/or materials when sold with and incidental to crushing equipment, and includes all those so engaged; provided that the Subdivision shall not include crushers and associated machinery when mounted in portable units—also excluding hammermills.

28. Roller and Silent Chain Subdivision

Means the manufacture for sale of sprocket chain of steel, or other metals excepting malleable iron, of the types generally known as inverted tooth or silent chains, finished roller and rollerless-bushing chains (but not those commonly known as semi-finished chains), block chains having either cold drawn or laminated center blocks, and parts thereof, and such sprockets therefor as are manufactured by the manufacturers of said chains, and includes all those engaged in such manufacture for sale.

29. Rolling Mill Machinery and Equipment Subdivision

Means the manufacture for sale of rolling mill machinery and equipment, including rolls (except hardened steel forged rolls unless made and sold as a part of such rolling mill machinery and equipment) and including roll stands, tables, shears, roll lathes, tube mill machinery and all other auxiliary equipment and parts thereof used in the rolling and processing of ferrous and nonferrous metals to produce commercially recognized rolling-mill products, and includes all those engaged in such manufacture for sale.

30. Sawmill Machinery Subdivision

Means the manufacture for sale of machinery and parts thereof for use in sawmills for converting saw logs or timbers into lumber and other timber products, and includes all those engaged in the manufacture of such machinery for sale.

31. Small Locomotive Subdivision

Means the manufacture for sale and selling of locomotives of 600 horsepower or less, and/or parts thereof, and includes all those engaged in such manufacture for sale; locomotives of more than 600 horsepower, but not to exceed 1200 horsepower capacity and/or parts thereof may be manufactured for sale and sold by either this subdivision or the locomotive manufacturing subdivision under this code; provided, however, that such locomotives propelled by electric motors including parts thereof for use therein, may be manufactured for sale and sold either by members of this subdivision under this Code or by members of the "Electrical manufacturing industry" under its code. "Horsepower" means the figure arrived at by multiplying tractive effort (taken at that speed at which the maximum horsepower will be produced) by the speed in miles per hour and dividing that result by 375.

32. Sprocket Chain Subdivision

Means the manufacture for sale of sprocket chains of malleable iron, steel and other metals for conveying, elevating, and the transmission of power of the types generally known as roller chains, rollerless bushing chains, block chains, malleable and other cast detachable pintle and roller chains, balance and leaf chains, bar link chains, steel detachable link chains, combination cast and bar link chains, drop forged and rivetless chains, draw bench and haul-up chains, taintor gate and bridge chains, and parts for such chains and sprocket for same, and includes all those engaged in such manufacture for sale; except that there shall not be included therein the manufacture for sale of chains for hand hoists and those generally known as round link or coil chains, or machine finished chains, as defined in the definition of the roller and silent chain subdivision. The manufacture of sprocket chain by farm equipment manufacturers is excluded from the manufacturing provisions of this code but the marketing and trade provisions shall apply to all sprocket chain sold by such farm implement manufacturers for all purposes other than for use on farm implements.

33. Steam Engine Manufacturing Subdivision

Means the design, manufacture, contracting for or subletting the manufacturing for the sale of reciprocating steam engines, including spare, repair and replacement parts thereof for land and marine use, and includes all those so engaged; provided that the subdivision shall not include locomotive and automotive types or spare, repair and replacement parts thereof.

34. Steel Tire Manufacturing Subdivision

Means and includes only the business of manufacturing and selling locomotive and railroad car wheel tires, other annular weldless rolled steel sections, and steel tired wheels for railroad, railway and/or industrial use.

35. Water Meter Manufacturing Subdivision

Means the manufacture for sale of water meters and parts thereof, and includes all those engaged in such manufacture for sale.

36. Waterpower Equipment Subdivision

Means the business of manufacturing for sale, selling, erecting and/or designing equipment or machinery as enumerated below:

(Group 1) Hydraulic turbines, water wheels, impulse wheels, governors, governor pumping systems including pressure tanks and dump tanks, flume manholes, relief valves, energy absorbers, free discharge valves, drain valves, special and automatic valves; also cast iron or cast steel or steel plate or structural steel (riveted or welded) spiral casings, pressure casings, speed rings, turbine wicket gates, head covers, curb plates, throat rings, bearings, bearing housings, pit liners, draft tubes and liners, short steel penstocks and intake pipes not exceeding thirty-five feet in length; all of the above for water power plants.

(Group 2) Turbine shut-off valves, bypass valves, butterfly valves, large and special gate valves, needle valves, cylinder valves, conical valves and spherical valves for water power plants. This Group 2 shall include only such valves and fittings, including parts therefor or for their servicing, as are made by an employer in this Subdivision as a part of the products thereof for water power plants only, or as a separate assembly peculiar to such products.

(Group 3) Head gates, crest gates, sluice gates (except such sluice gates of cast metal construction, in no event of more than 10 feet diameter opening, as are normally produced and sold by members of the Valve and fittings manufacturing Industry), bypass gates, trash racks, rack rakes, lock gates, bear trap gates and modifications thereof, roller gates, roller sector gates, drum gates, vertical lift gates, vertical lift sector gates, taintor gates, taintor gate valves, cylindrical valves, filler gates, automatic gates, flashboards manually or automatically operated, of cast and/or fabricated steel plate construction together with hoists, operating machinery and automatic control equipment therefor. (Structural steel plates, shapes and bars included in the products of this Group 3 may be sold, fabricated and erected under the code of the "structural steel and iron fabricating industry," or the code of the "steel plate fabricating industry," by employers in either of such industries who are not engaged in the production of other products in this Group 3.)

And other mechanical, plate and structural equipment including accessories and parts thereof applicable to groups 1 and 2 for water power plants and applicable to group 3 for water power plants, navigation dams, impounding dams, irrigation works, flood control works, water supply works including accessories, spare parts, repairs, replacement parts and parts thereof for all other water power and control purposes excluding gantry crane hoists.

37. Water Softener and Filter Subdivision

Means the manufacture or assembly for sale of zeolite water softeners, lime-soda water softeners, water filters, and products allied thereto including the zeolite used therein and parts thereof, and includes all those engaged in such manufacture or assembly for sale.

38. Wire Machinery Subdivision

Means the manufacture for sale of machinery for drawing wire and rod and the fabrication of wire and rod products. This includes wire and rod drawing machinery and accessories, shaping and flattening mills, machinery for stranding, cabling, etc., cutting-off, pointing, straightening, armoring, bending, forming, cold upsetting, cold heading, etc., and in general all machinery used in the working, processing or finishing of articles made from wire or rod in its raw state, and parts thereof, and includes all those engaged in such manufacture for sale. Employers not otherwise engaged in this subdivision may manufacture for sale and sell machinery for cold upsetting and heading, and finishing machines for the product thereof, under the provisions of the code of another industry and not under the provisions of this Code.

39. Woodworking Machinery Subdivision

Means the manufacture for sale of woodworking machinery (exclusive of sawmill machinery), accessories and parts thereof, and includes all those engaged in such manufacture for sale.

EDITORIAL

Who Will Benefit Most From Wagner Bill Hearing?

IN PRESENTING important testimony against the Wagner bill before the senate committee on education and labor on April 5 and 6, employers and employes of the steel industry performed a great service to their contemporaries in all industries.

Seldom have spokesmen for the iron, steel and metalworking industries appeared in a government hearing to better advantage. Never before had employers and employes stood shoulder to shoulder under the spotlight of national scrutiny in protest against a threatened menace to their common interests. The performance was praiseworthy in every respect. All industry is indebted to each participant for his contribution to its success.

The event should be beneficial in several directions. For instance, if the senators of the United States are as alert politically as they are reputed to be, they will sense from the appearance of several scores of steel company employes a fact of deep political significance which apparently has escaped the notice of politicians. The incident should serve to remind senators that the great majority of employes in industry —the 90 per cent or more who are not affiliated with national labor unions—have rights which have been overlooked or ignored by congress. The fact also should dawn upon the senators that the potential votes of these 27,000,000 ununionized employes are more potent than those of the 3,000,000 alleged members of national labor unions or of the several millions of world war veterans—both of which last named groups have been coddled shamelessly by members of both houses of congress.

Independent Worker a Factor To Be Reckoned with as Political Force

In the past the political strength of the independent industrial employes has been discounted because these men were not united for political action. Should congress continue to ignore the interests of this group, it might—as a result of discrimination such as was threatened by the Wagner bill—organize on national lines in order to protect its interests. How ironical it would be, if Senator Wagner's attempt to bend the nation to the will of national labor unions should in reality set off the spark which would incite 27,000,000 independent employes to militant political action!

Another probable benefit of the Wagner bill hearing will be an acceleration in the progress of employment relations in the iron, steel and metalworking industry. In the majority of companies the relationship between employes and management has improved considerably in the last two decades. Today, with the experience of artificially fomented trouble by government agencies fresh in their minds, industrial executives and employes are giving and will continue to give more attention to agencies which will provide the best facilities for bargaining between employer and employe. Inasmuch as an overwhelming majority of workmen in this industry prefer individual bargaining or bargaining through works councils or employe representation plans, the road to improved labor relations lies in the refinement of these agencies. Not until the national labor unions clean house, eradicate racketeering, and assume responsibility for their acts, will they be in a position to offer industrial employes a means for collective bargaining comparable with that now obtainable through employe representation plans. If national labor union chiefs will recognize this fact, they, too, may learn a valuable lesson from the Wagner bill hearing.

Clear Statement of Industry's Case Is Aid to Better Understanding

A third and perhaps the most significant point is that the hearing again shows what can be accomplished by stating industry's case clearly to the public. Almost every difficulty in which the steel industry has been involved has been due in a large measure to ignorance on the part of congress or of the public of steel's real position. Time and time again national resentment against the steel industry has mounted to dangerous proportions simply because no one felt it was worth while to inform congress or the public of the real facts involved.

Thanks to a more intelligent policy of public relations inaugurated recently by the American Iron and Steel institute, this problem now is being attacked vigorously. It is a tremendous task. Right now it is important that certain information on costs, prices, price structure, capacity, production, etc. be made more generally known in public circles. Only by such means can the industry hope to receive fair treatment from the administration and congress.

Today too many influential officials in Washington are openly prejudiced against the steel industry. In nine out of ten cases the prejudice is due to misinformation or to inability to properly interpret the facts.

The first duty of the industry is to destroy this unwarranted prejudice. The effective weapon for the job is information.

THE BUSINESS TREND

Optimism Spreads, Although Business Still Is Spotty

BUSINESS sentiment again is running ahead of business actualities. For several weeks the growth of optimism has been marked, yet during this period weekly indicators have reflected a spotty situation.

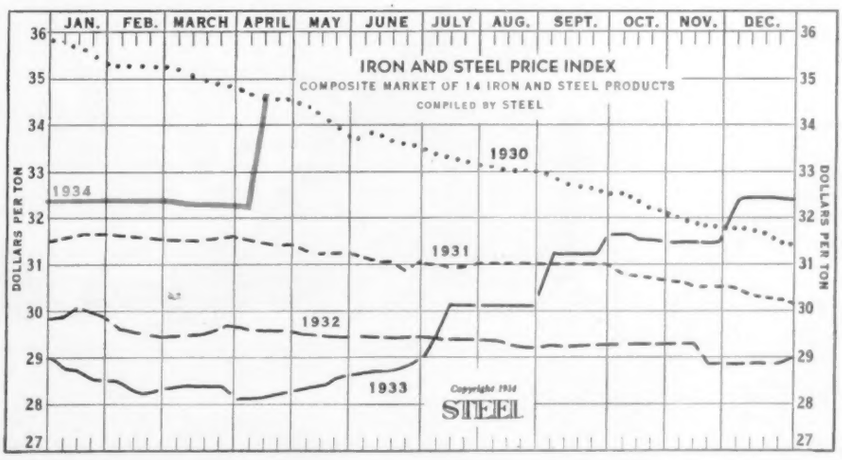
Revenue freight car loadings for the week ending March 31, which from preliminary figures were expected to show a slight gain, actually were 19 cars below the figure for the previous week. Loadings for the week ending April 7 probably will be down moderately. Electric power output in the same week slumped rather sharply, dropping to the lowest level since the week of Jan. 27. On the other hand, steelworks operations, which have fluctuated within narrow limits during the past month, again are pointed upward more positively.

Monthly barometers are consistently favorable. The record for March was gratifying. Production gained by comfortable margins. The shipments of finished steel by the United States Steel Corp. leaped to 588,209 tons from 385,500 in February, a clear gain of 52.6 per cent. Building awards in March totaled $179,163,000 against $96,716,300 in February. However, this gain falls short of restoring the losses sustained since last December. Construction still is one of the weakest elements in the business picture.

One of the favorable factors in recent weeks is the growth of employment and the gains in payrolls. Jobs and wages have increased somewhat more, relatively, than has industrial production.

Wage Earners Helped by Government; Ten Million Stockholders Await Their Turn

In due time the stockholders of the country will be heard in defense of their rights. A recent survey shows 26,000,000 registered stockholders of American companies. Allowing for duplications, it is estimated that 10,000,000 individuals are affected by dividend policies. This army has been asked to stand aside while wage earners were served first.

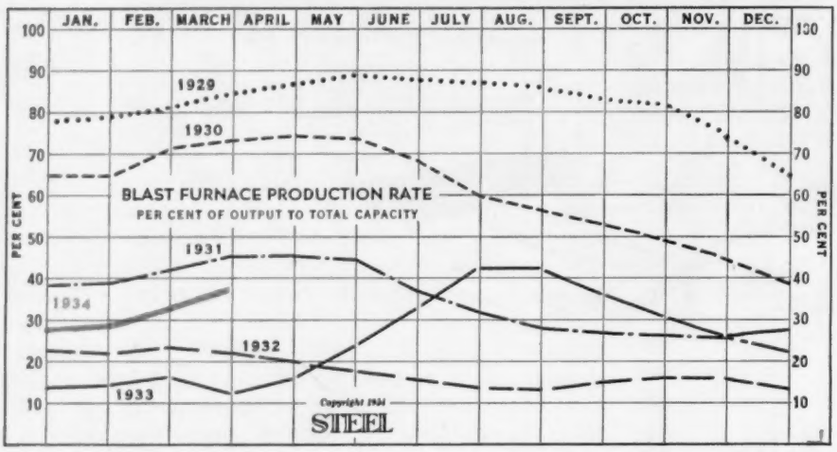


1934

April 14	$34.81
April 7	32.40
March 31	32.40
March 24	32.40
March 17	32.40
March 10	32.40
March 3	32.40

1933

April 15	$28.14
April 8	28.14
April 1	28.12
March 25	28.35
March 18	28.35
March 11	28.35
March 4	28.35



	Per Cent
March, 1934	38.0
February, 1934	32.9
March, 1933	12.7

97 Blast Furnaces Active At End of March

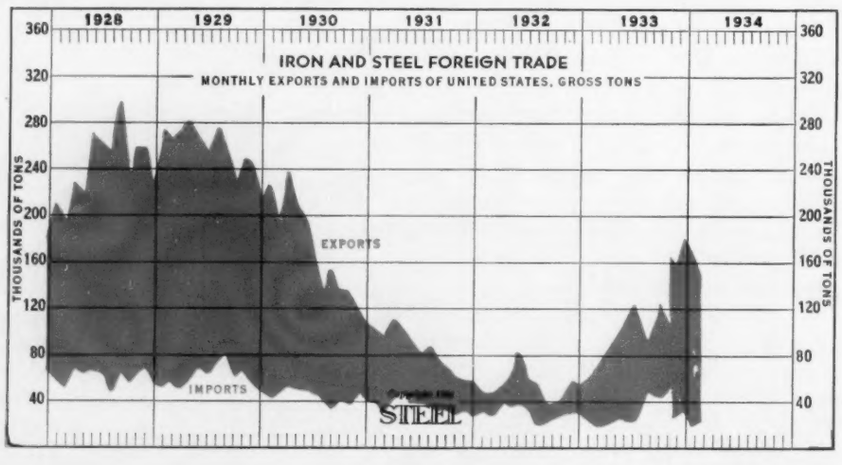
With the total output of pig iron showing an increase of 354,796 tons in March, the number of operating blast furnaces moved from 90 at the close of February to 97 at the end of March. This was the largest number of furnaces active at the close of any month since last August, when 98 were producing iron. At the close of March one year ago only 38 were in production. Relating production to capacity, the operating rate for the third month was 38.0 per cent, as compared with 32.9 in February and 28.7 per cent in January. The March rate was the highest since last August with 42.8 per cent. One year ago the operating rate was only 12.7 per cent.

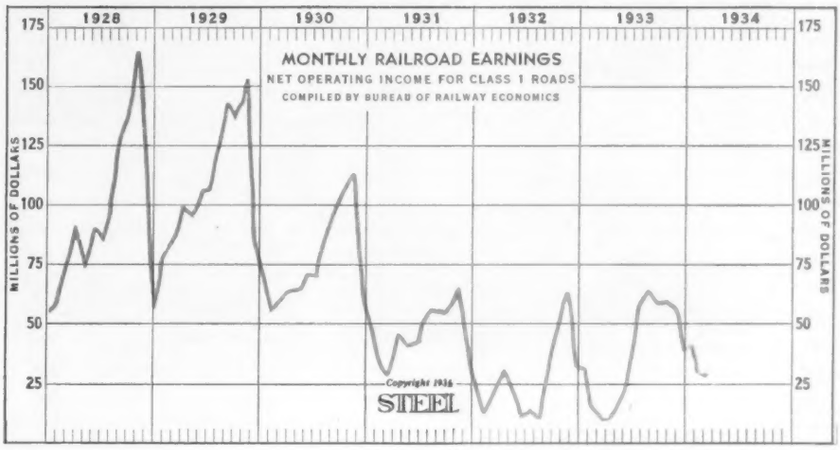
February Iron and Steel Export Trade 136 Per Cent Greater Than Year Ago

Iron and steel exports of the United States in February totaled 151,184 gross tons, a reduction of over 15 per cent from the 178,023 tonnage shipped in January, according to compilations of the iron and steel division, department of commerce. While the February export figure represents the second successive month in which tonnage has declined, it is still 136.6 per cent greater than in February a year ago, when steel exports fell to 63,936 gross tons. Imports advanced 12 per cent in February for a total of 25,407 gross tons. Scrap was the largest single item of export in spite of a loss of 25 per cent from the record shipments of December, 1933.

Exports	Tons
February, 1934	151,184
January, 1934	178,023
February, 1933	63,936

Imports	Tons
February, 1934	25,407
January, 1934	22,653
February, 1933	19,748





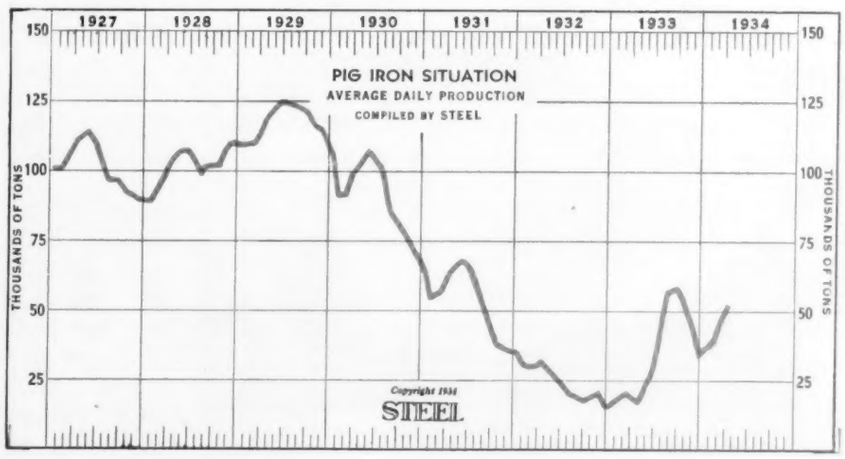
February, 1934	$29,281,008
January, 1934	30,931,202
February, 1933	10,133,777

Railroads in February Earn at Annual Rate of 1.84 Per Cent

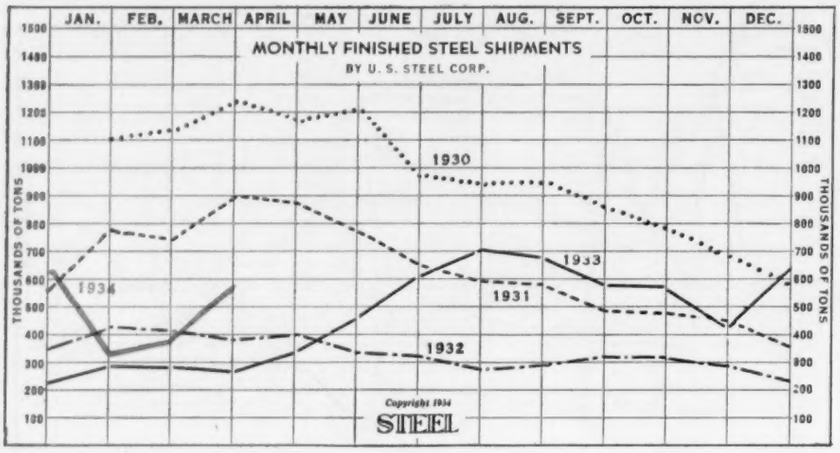
The net railway operating income of the Class 1 railroads in February amounted to $29,281,008, which was at the annual rate of return of 1.84 per cent on their property investment, according to reports filed by the carriers with Bureau of Railway Economics. This is a slight reduction from the $30,931,202 earned in the preceding month but compares favorably with the record of February, a year ago, when net income totaled only $10,133,777. During the first two months of this year the railroads' net operating income totaled $60,209,882, or 1.99 per cent on investment compared with 0.78 per cent in the same period last year.

March Iron Production Up Sharply; Highest Since Last August

The average daily production of coke pig iron in the United States for March was 52,438 gross tons, a gain of 7053 tons or 15.5 per cent over the 45,385 tons rate of the preceding month. This was the best showing since August, 1933, when the daily rate was 59,137 tons, and the highest March since 1931 when 65,448 tons were produced. In March, one year ago, production was only 17,484 tons and in 1932 the daily rate stood at 31,194 gross tons. The first quarter output, aggregating 4,122,023 tons, represents a gain of 147 per cent over the corresponding period last year. In the first quarter of 1932, total iron output was 2,899,002 gross tons.



March, 1934	52,438
February, 1934	45,385
March, 1933	17,484



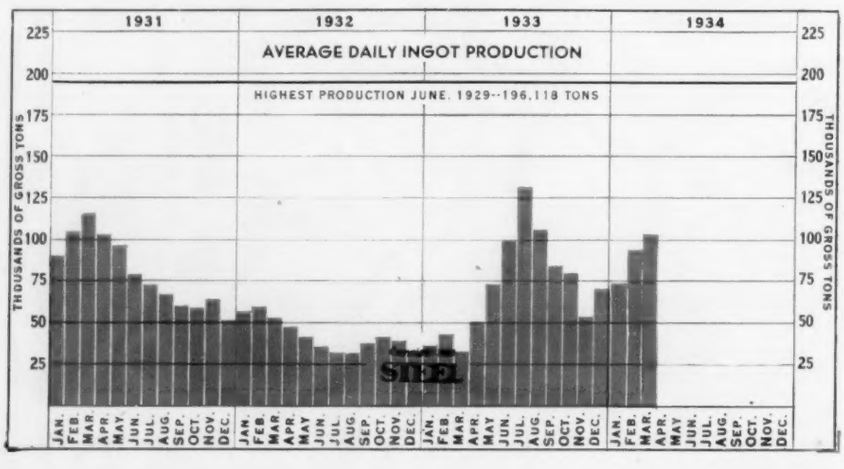
	Tons
March, 1934	588,209
February, 1934	385,500
March, 1933	256,793

Finished Steel Shipments Swing Upward in March

Finished steel shipments by the United States Steel Corp. advanced sharply during March, according to the monthly report of the corporation. Total shipments in March were 588,209 tons, an increase of 202,709 tons compared with a movement of 385,500 in February. In March a year ago shipments totaled 256,793 tons, in March 1932, 388,575 tons and in the corresponding period of 1931 there was a movement of 907,251 tons. For the three months ending March 31, shipments of finished steel products by the Corporation totaled 1,305,486 tons and compares with 817,960 tons in the first three months of last year. The advance in finished steel quotations promises another stimulus to steel ordering in the near future.

Ingot Production Climbs; March Operations at 47.8 Per Cent

Registering another substantial gain, production of steel ingot in March moved to the highest level since last August. According to the monthly statistical report of the American Iron and Steel institute, open-hearth and bessemer steel ingot production in March totaled 2,797,194 tons, or 103,600 tons a day. This compares with 2,213,569 tons or a daily average of 92,232 tons in the preceding month. In March 1933 output was calculated at 909,886 tons and a daily average of only 33,699 tons. In three months steel ingot production thus totals 7,007,660 tons or more than double the 2,961,735 tons produced in the same period of 1933. March operations were the highest since last August averaging 47.81 per cent.



	Tons
March, 1934	103,600
February, 1934	92,232
March, 1933	33,699

ON THE TESTING GROUND: Steel plate road guard manufacturers do not depend entirely on accidents to reveal the strong and weak points in their guards. They run heavy trucks and light automobiles, at varying speeds and angles, into them; measuring deflections

ROAD GUARDS OFFER MARKET FOR STEEL IN MILLIONS OF TONS

BY A. J. HAIN
Associate Editor, STEEL

ONE out of seven fatal automobile accidents in the United States is caused by a car running off the roadway, figures compiled by the National Safety council indicate.

Since speed limits were raised, or removed entirely in many states, faster automobiles have been built and truck transportation has increased, with the result that the number of such accidents has been multiplying. The great majority occur at unguarded or insufficiently guarded curves, bridge approaches, and long stretches of road paralleled by deep ditches.

Those who have studied this problem believe the only practical solution is an improved system of road guards, with steel the major construction material. Safety education and warning signs fail to prevent accidents where unusual hazards call for slow driving. Motorists must be protected at the modern tempo of travel; old-type guards must be replaced.

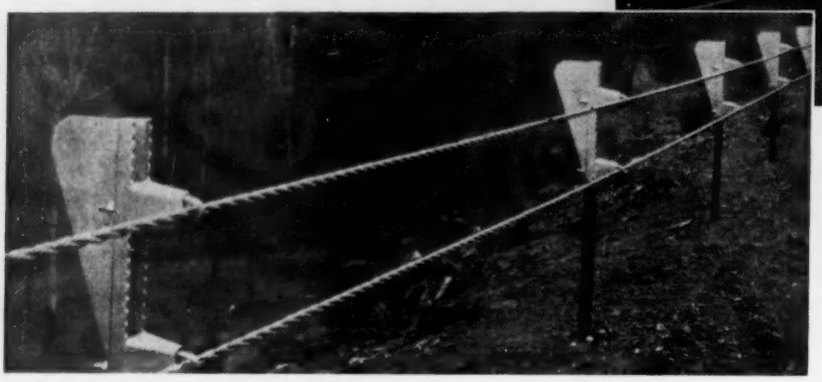
In this, those who are in the forefront of road guard development are convinced lies a market for millions of tons of steel.

Along the 853,000 surfaced miles in this country's 3,000,000-mile road system are many frail wood guard rails which give motorists a false sense of security. Before the government's emergency appropriation has been spent at least 23,000 more miles of roads will be surfaced. Two million miles in the secondary system have never been improved in any way, though half this is important enough to be classed as part of the federal post-roads system.

Pioneers in road guard engineering see in this a continuing market, not only for replacing obsolete types, but in supplying new and modern requirements as road improvement is extended.

Laws in most states make the erection of road guards at danger points a compulsory part of road improvement. But much work has been done in the past three years with the primary purpose to provide jobs, on the spot.

FURTHER EVOLUTION OF ROAD GUARDS: Heavy cables, with adjustable steel posts and vision plates are taking the place of old mine cables, while wood has a still more formidable rival in resilient steel plates, offset from steel posts



Where lumber has been available nearby it generally has received the first call for the erection of guards. Road engineers have had to economize on material, to spend more on labor, so that the new types of guards have been handicapped. Notwithstanding, their merits have been recognized.

The public, however, is not yet fully aware of the fact that in the past two or three years—along with high-speed automobiles—there has been a remarkable developmnt in steel plate guards.

Twnty-five manufacturers are engaged in making them. The Plate Guard Rail Manufacturers' association has been formed, with offices in Cleveland; output by some other makers is distributed through various culvert associations. The desirability of a code has been discussed. A new industry has sprung up in a few years; has made progress despite the depression, and is almost certain to be an important factor in the future development of this country's roadways.

But lest it be supposed that all that is necessary to engage in this industry is to punch a few holes in steel plates and attach them to posts, it should be understood that there would be difficulties right at the outset. Patents have been procured on the really worth-while methods of assembly; and there is today patent litigation over some features which one might consider open to the use of anyone.

Plate Guard Demand Seen

In 1933, two million lineal feet, or approximately 5000 tons of steel plate guards were sold and installed by various state, county and municipal highway departments. Illinois purchased at one time 300,000 lineal feet; Pennsylvania 100,000.

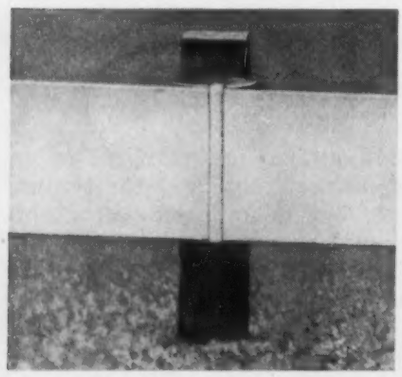
How much more steel in the form of cable or wire mesh was purchased for road guard purposes cannot be estimated, because these materials are put to many different uses. It is certain, however, that as regards recent installations in lineal feet wood, cable and mesh are a long way ahead of steel plates, due to universal availability and lower first cost.

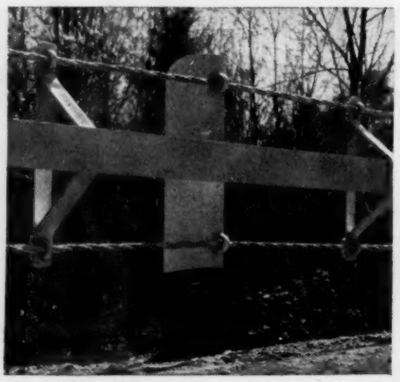
Plate guard purchases this year, according to leading manufacturers, will increase at least 50 per cent over 1933. Practically all have studied the possible future demand. One of the most comprehensive surveys undertaken led a manufacturer to interview and correspond with highway officials in many states. Certain eastern and middle western states were investigated with special care, and the results checked against estimates in other districts.

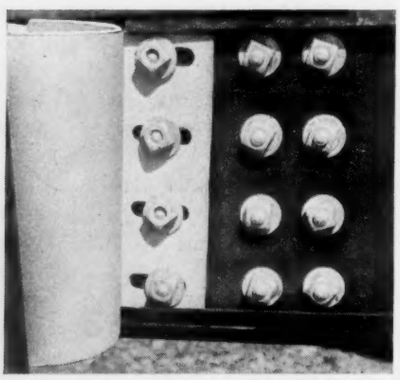
This manufacturer wanted to know the mileage of unguarded curves and dangerous roadways; the mileage of installed road guards, wood and other materials. And he concluded from his survey that the market offers a field for more than 10,000,000 tons of steel plate guards, his guards running 60 tons complete per mile.

Evidently, it was with no misconception of the broad market possibilities that the late Lee H. Miller, when chief engineer for the American Institute of Steel Construction devised what he called the armorsteel road guard, and brought it out in April, 1931, as one means for promoting steel consumption.

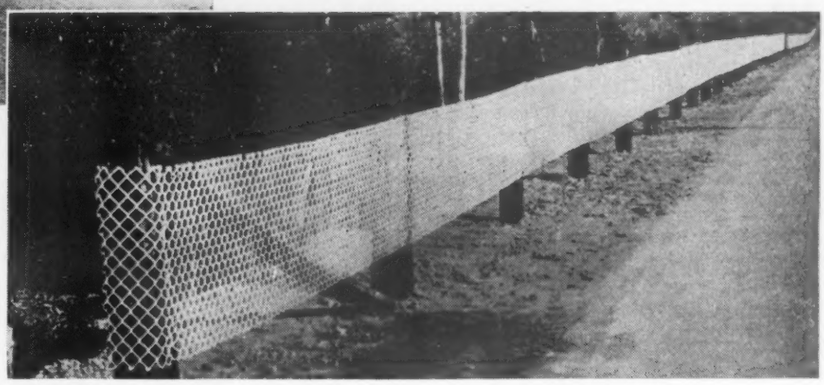
The only difficulty was that with







Left, steel cylinder fastened to post, with clip to hold plate to cylinder, allowing longitudinal play; center, combination plate and cable; right, leaf spring, and elongated bolt holes. Armorsteel plates have similar bolt holes



FOUR TYPES OF ROAD GUARDS IN USE TODAY: Wood, wire mesh, cable and steel plate. When turnpikes became paved highways and speed of automobiles increased discarded mine cables and wire mesh began to displace wood

each successive step-down in general business conditions this type of guard found more difficulty in competing with wood, cable and mesh. It did, however, awaken steel fabricators to future opportunities, and it led to other designs, intensive experimental work and scientific testing—all in preparation for the day when soundness and permanence will be the only "buy-words" for road guards.

True engineering design in road guard construction did not emerge until the advent of the plate type. There were specifications for, but no special design in the use of other materials. Every highway department had its own ideas of the right way to erect a wood, or combination wood and cable, guard.

The chief claims made for properly designed plate guards are their resiliency and ability to deflect motor cars back onto the roadway. They present a broad, smooth surface, do not splinter or entangle cars. Their special patented features are the methods employed for attaching the plates to posts, so as to obtain longitudinal play over a large part or all of the length of the guard.

It may be recalled that *Iron Trade Review*, STEEL'S predecessor, in its department "Large Uses of Steel in Small Ways," Jan. 17, 1929, page 204, described a guard then appearing on southern roads. This was one of the first and since has come to be recognized as one of the three or four primary designs. A cylindrical spring and hinge is bolted to a post, and supports the plates, serving to keep the latter continually under tension.

In another type, a leaf spring is bolted to the post, the plates being fastened to one of the outer edges of the spring. In this, the longitudinal edges of the plates are turned over, and telescope at their juncture with the spring.

Coiled Springs Provide Tension

In a third, a steel cylinder is bolted to a post, and the plate held in position by a steel clip, the ends of the clip being turned back over the edges of the plate and the cylinder. This allows for longitudinal strain. The plates are bolted together midway between the posts.

Heavy coiled springs are used at the end posts in most of these assemblies, to keep the entire length of guard under tension.

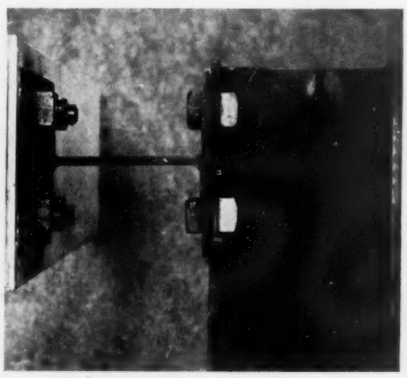
Coiled springs to support the plates at intermediate posts also have been tried; also, projecting steel prongs or brackets.

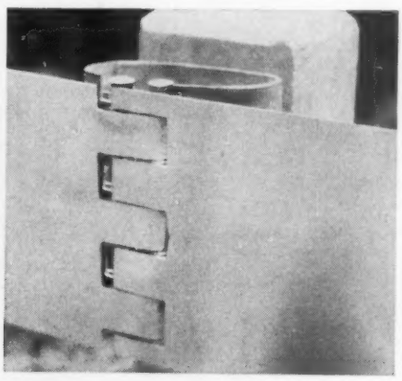
In one type described in STEEL, Aug. 7, 1931, page 38, two steel cables are strung along the posts, tightened at the ends, and V-shaped brackets attached to the cables to extend and support plates.

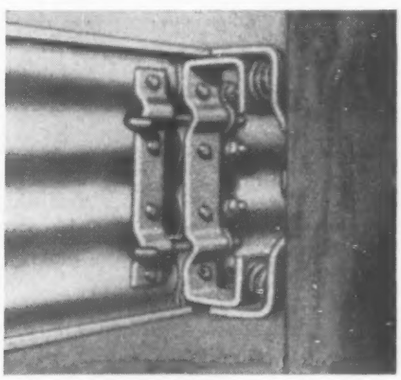
The distinguishing features of the armorsteel guard are the I-beam posts, and sections of I-beams used to offset the plates from the posts. This guard does not employ springs, but in addition to the natural resiliency of ¼-inch steel plate, some longitudinal play is obtained by elongated bolt holes in one end of the plate. When the guard is struck the impact bends the plate, and takes up this "slack." Elongated bolt holes also are employed in some of the leaf spring guards.

The character of the steel and thickness of the plates, of course, also are important factors determining their resistance and resiliency. High-carbon steel commonly is used.

(*Please turn to Page* 40)







HOW ENGINEERS HAVE SOUGHT TO SOLVE THE PLATE ROAD GUARD PROBLEM: Left, the armorsteel, with rigid post and offset; center, resiliflex, spring and hinge; right, an early development, using spiral springs and corrugated plates

Develops Insulated Steel Frame for House Building

DURING the past few years much interest has been shown in light steel structural frames to be used in combination with other fireproof materials in residence construction. Recently, a new and simplified design for a steel frame, particularly adapted to such light buildings, has been developed by Insulated Steelbilt Structures Inc., Amsterdam, N. Y. Among advantages of this system of framing are its flexibility to various types of architecture and the economies of shop fabrication.

A general idea of the construction may gained from the sketch in Fig. 1. The structural framing member for all walls and partitions is a stud, consisting of two 4-inch, No. 16-gage channels tied and anchored together with steel pins. Backs of the channels face each other and are 1 inch apart, this space being filled with a fireproof nailing compound. A cross section of the standard section is shown in Fig. 2.

DESCRIBED in this article is a recently developed system of steel framing for residences and other light structures. Features of this frame are its advantages of shop fabrication, simplicity in assembly and flexibility to various types of architectures. It affords complete insulation and ease in installing air conditioning. In recent issues, STEEL *has described two low-cost, shop-fabricated steel houses; the first appeared in the issue of April 2, Page 30, and the second in the issue of April 9, Page 37. Additional types will be described soon.*

For all floors and roofs, the structural framing member is a joist or rafter of similar design and construction with the exception that joists are of deeper channel sections, dependent upon spans and loads. Standard spacing for all studs, joists and rafters is 24 inches.

Tie Channels Welded to Studs

No. 11-gage tie channels are welded to the face of each stud at the top and bottom of sections. The bottom tie channel of first story wall sections is the same height as first floor joists and is bedded on the foundation wall. It acts as a sill, as a rigid bottom tie and spacer for the studs, as a support for the ends of floor joists, and provides a continuous horizontal chase around the room for the installation of electric wiring and small piping.

The top tie channel of first story sections is one-half the height of second floor joists and forms a rigid top tie and spacer for the first story studs. The combination of the studs with top and bottom tie channels forms a square and rigid first story wall or partition section. These sections are shop fabricated one story high and the full length of the sides and ends of a room. Windows and doors may be located as desired.

Second story wall and partition sections are of similar construction, the bottom tie channels being one-half the height of second floor joists and the top tie channels the same heights as attic floor joists. The upper sections rest on and are welded to the sections below. On the top of the uppermost wall sections a continuous 4-inch, No. 11-gage channel is welded to form a wall plate.

Floor joists are fabricated and erected as independent members and have short No. 11-gage channels welded on each end which engage and are welded to the tie channels of wall and partition sections.

Roofs are shop fabricated in sections similar to walls and partitions. Rafter connections at the plate, tie beam and ridge are of a hinge type, thus permitting any desired angle of roof slope without change in the connection. This construction is illustrated in Fig. 4. All corners, angles and junctions of walls and partitions are tied together by a standard angle connection to insure strength and rigidity at these points. Three types of angle connections are sketched in Fig. 3.

Sheathed with Insulation

Any standard rigid insulating board may be used for outside and roof sheathing and for covering all interior walls, partitions and ceilings. Plastering may preferably be omitted and the wall covering, such as canvas, paint, paper or fabric, applied directly to the insulating board. A light weight, fireproof, precast insulating floor tile, spanning from joist to joist and finished on top with cement and sand or gypsum screened and floated level, provides a base for any type of finished floor-

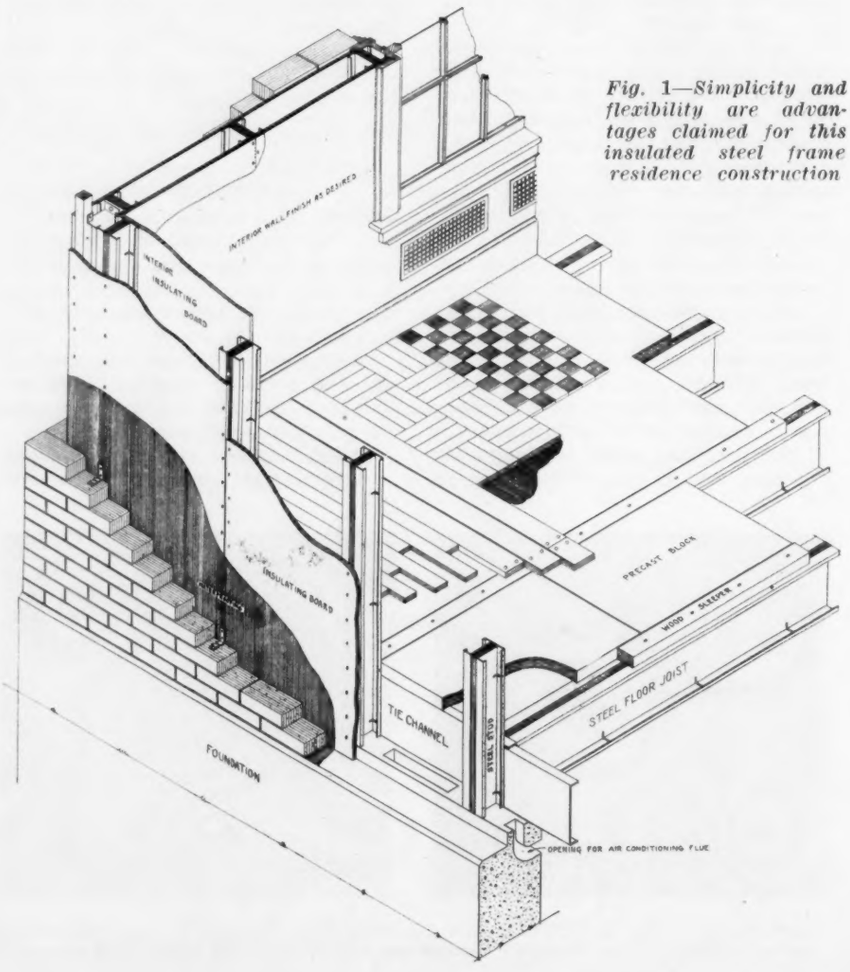


Fig. 1—Simplicity and flexibility are advantages claimed for this insulated steel frame residence construction

DRILL MORE HOLES PER GRIND

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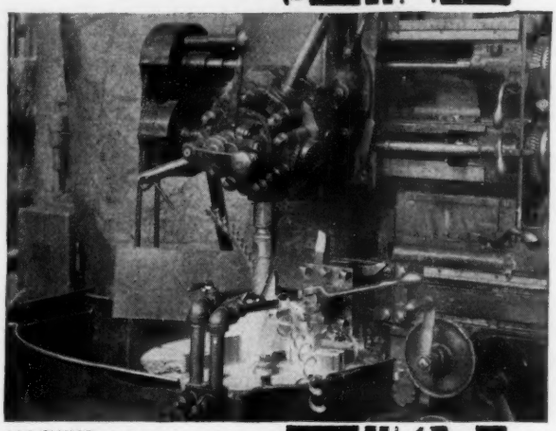
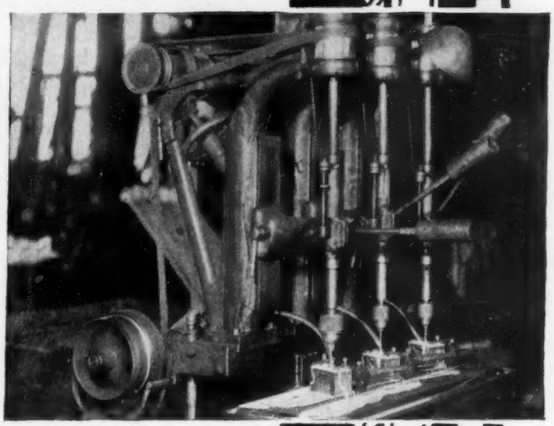
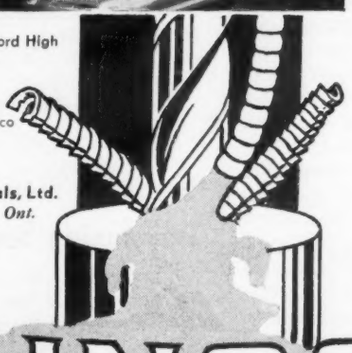


MACHINE: Bullard Vertical Turret Lathe.
MATERIAL: 3135 Steel.
DRILL: 2¼ in., 70 R.P.M.
LUBRICANT: 1 part Sunoco to 20 parts water.
Courtesy of **The Bullard Co.**
Bridgeport, Conn.



MACHINE: Leland - Gifford High Speed Drill Press.
MATERIAL: Bolt Steel.
DRILL: No. 3; 644 R.P.M.
LUBRICANT: 1 part Sunoco to 15 parts water.
Courtesy of
Canadian Line Materials, Ltd.
Scarborough Junction, Ont. Canada



THE drilling of metals is so often regarded as such a simple operation that it may be overlooked as an important factor in costs.

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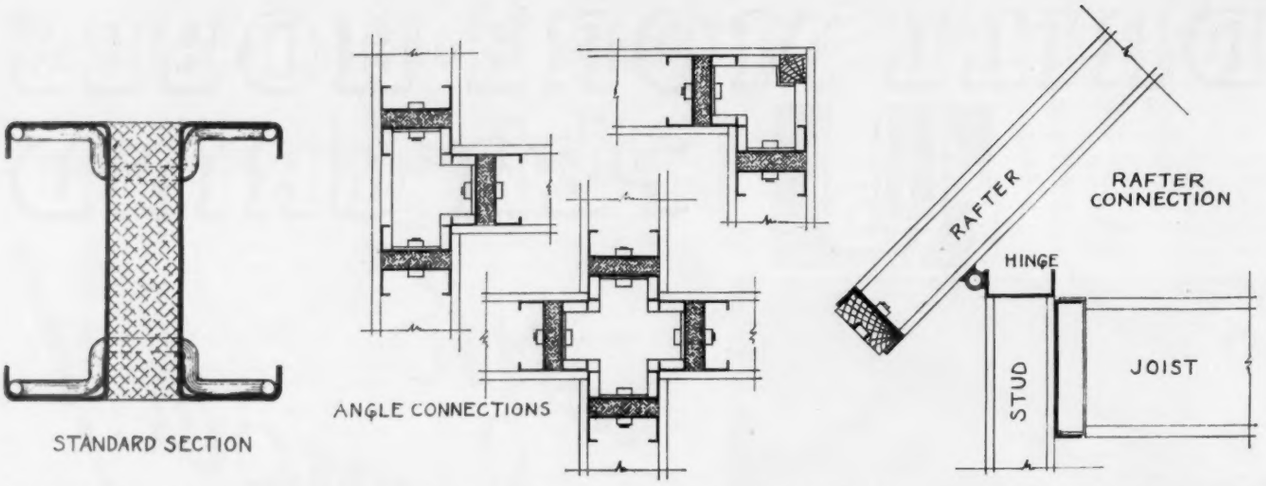

Fig. 2 (Left)—The standard section consists of two light channels separated with a layer of insulation and securely tied together. Fig. 3 (Center)—A standard angle connection is used to tie together all corners, angles and junctions of walls and partitions. Fig. 4 (Right)—Rafter connections at the plate, tie beam and ridge are of the hinge type permitting any desired angle or roof slope

ing such as wood strip, wood block, linoleum, tile or terrazzo. Field work in constructing a house with this type of frame is said to be relatively small, consisting of the erection and welding in place of wall, partition and roof sections and floor joists. Because of standardization and simplicity, a selling price can be estimated by taking off the square footage of exterior walls, interior partitions, floors and roofs. For the same reason, it is said that all shop and field drawings and details can be made at a cost of not to exceed $5 per ton.

During development of the new house framing, special consideration was given to air conditioning, therefore horizontal cut-offs in walls and partitions were eliminated so as to permit the easy installation of air conditioning ducts.

It is the purpose of Insulated Steelbilt Structures to contract for the manufacture and erection of its steel frame, floor system and insulation, also to co-operate with architects in adapting the frame to their designs.

Copper Improves Steel Properties

INCREASING use of copper as an alloying element in iron and steel is a current development of considerable interest, recently conducted research along this line indicating that copper results in improved physical properties of the ferrous materials and in a comparatively economic way.

This development was hinted at in a general way by Dr. H. Foster Bain, managing director, Copper and Brass Research association, New York, who on April 9 addressed the Cleveland chapter of the American Society for Metals at its annual nonferrous meeting. Dr. D. K. Crampton, director of research, Chase Brass & Copper Co., Waterbury, Conn., presided as technical chairman of the meeting.

In his address, Dr. Bain reviewed the history and the present economic status of the copper industry. He pointed out that for every ton of steel used in the United States, approximately 60 pounds of copper are consumed and of all the copper fabricated into finished products, about 30 per cent is refined from scrap material.

Use in Steel Studied

During the depression, the copper industry has been seeking new uses for the metal, consequently the Copper and Brass Research association engaged the Battelle Memorial institute, Columbus, O., to undertake a program of research. At the outset, it appeared that the most promising market would be as an alloying element in ferrous metals, for at present about 1,000,000 tons of rolled steel, principally sheets, contains 0.25 per cent copper. In this application, the copper would not come back as scrap for remelting.

Preliminary investigation by Battelle Memorial institute revealed many conflicting reports on the effect of copper as an alloying element in steel, therefore, research was directed toward the end of establishing conclusive evidence one way or the other. Thus far, all evidence appears favorable.

It has been found that 1.5 per cent copper in rolled steel improves physical properties from 10 to 20 per cent without heat treatment; with heat treatment, the properties are improved another 10 to 15 per cent. The tensile strength of cast steel is improved 10 to 20 per cent. The physical properties of malleable iron can be increased by additions of copper and recently considerable attention has been focused on gray cast iron with copper content.

Another recent development is the use of copper stools for casting steel ingots. The copper stands up well and has the advantage of conducting heat away from the ingot quickly. It has been demonstrated that copper stools are practical not only from the metallurgical and operating standpoints but from the cost standpoint as well.

During the afternoon preceding the meeting, the Chase Brass & Copper Co. opened its plant at Euclid, O., to members of the chapter for an inspection trip.

The Cleveland chapter elected the following officers for the coming year: Chairman, E. F. Ross, associate editor, STEEL; vice chairman, H. B. Pulsifer, metallurgist, Ferry Cap & Set Screw Co.; and secretary-treasurer, G. T. Williams, sales metallurgist, Cleveland Tractor Co.

Status of Flame Cutting, Machining Surveyed

Comprehensive review of the present development of the art of machine cutting and flame machining by the oxyacetylene process is published in the February issue of the *Journal of the American Welding Society*. The article, replete with tabular material and illustrations, was prepared by Richard F. Helmkamp, applied engineering department, Air Reduction Sales Co., New York. Speed and flexibility of the two processes are emphasized, as well as economies which their use makes possible.

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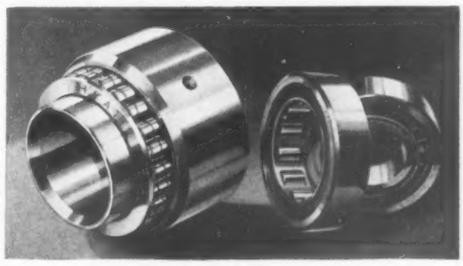

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Making the Most of METHODS AND MATERIALS

Cast Iron Strengthened By Adding Copper

Little has been published concerning the use of copper in cast iron. A recent investigation indicates that copper like silicon and nickel decreases the tendency of cast iron to chilling. It assists the decomposition of primary cementite or prevents its formation. This effect of assisting graphitization together with the change of the pearlite to sorbite or a higher form in the matrix and the strengthening of the ferrite because of dissolved copper results in a hard, strong iron which because of the absence of free cementite possesses good machinability. The effect of copper on the hardness and the strength in compression is marked, and the advantage of improved machinability is retained. Tensile and transverse strengths also are improved materially both by this strengthening of the ferrite and refining of the matrix and in addition by the refining of the graphite precipitate and the uniformity of its distribution.

\$ \$ \$

Automobile Hub Caps Are Stamped from Stainless

Stainless steel hub caps used on a popular-priced automobile are reforced with a heavier backing of low-carbon steel sheet. Operations through which they pass are blanking from strip stock, drawing, trimming, flanging and pressing, assembling, spinning of the edges, washing and painting. No lubricant is found necessary in the drawing, but the blank must be held very snugly to allow no slip. Actually the gage of the metal is reduced materially. Punches and dies are made of nonshrinking chromium steel. In trimming, the punch and die are made with very little clearance to give sharp shearing action.

Die Steel Wear Resistant

A recently introduced type of oil hardening die steel employs 12 per cent or more chromium and 2.00 per cent carbon; in air hardening varieties minor additions of vanadium, cobalt, or molybdenum are made. Such steels are used for cold heading and coining dies where great resistance to wear is desired. They have been found to be quite resistant to moderate operating temperature. As is indicated by their analysis, they are closely allied to the stainless steels.

\$ \$ \$

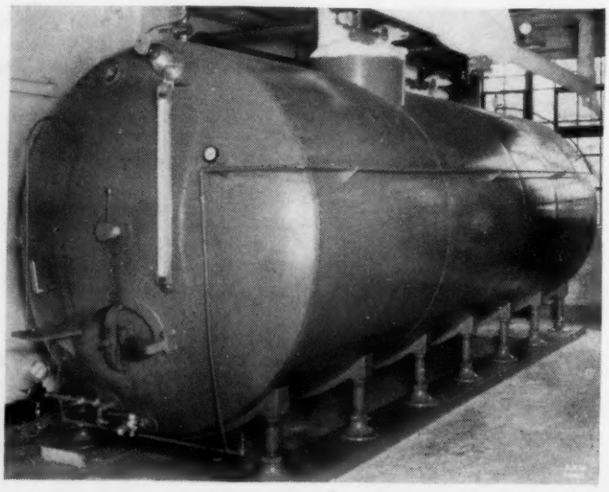
Heats Water with Reversed Refrigeration Unit

A recent development of interest is the use of the reversed refrigerator process to heat water. In this case, the type of compressor utilized in a refrigerator has its operation reversed to provide heat instead of cold. Water from a storage tank is circulated through the compressor unit and there picks up heat during the cycle of changing the refrigerant from a gas to a liquid. Most of the heat used to raise the temperature of the water about 140 degrees is extracted from the atmosphere of the room, the compressor acting as a heat pump. By utilizing all the heat losses of the motor and compressor, in addition to the other processes, a heating unit of high efficiency has been obtained.

\$ \$ \$

The two tail shafts on the U. S. S. HENDERSON recently were coated with approximately 0.032-inch of cadmium,

CHAMPAGNE, claimed to be equal in flavor and potency to the aged type of effervescent wine, can be produced in 72 hours in this welded steel tank manufactured by the Cream City Boiler Co., Milwaukee. This tank, used for carbonating and cooling champagne, is equipped with a refrigeration unit, agitator and telegage for measuring the contents. Capacity is 6000 gallons. The inner tank is insulated with cork, covered with waterproof mastic and an all-welded steel sheathing. A special coating applied to the walls of the inner tank prevents off-flavor to the product. Government regulations were met in construction of the tank which operates at a pressure of 50 pounds per square inch. Two direct expansion ammonia cylinders immersed in the champagne reduce the temperature from 80 degrees Fahr. to 32 degrees in 20 hours. The agitator and agitator shaft are made entirely from 18-8 chrome-nickel stainless steel



ADVERTISING PAGES REMOVED

which remains electro negative to an iron base in the presence of salt water, thus eliminating corrosion. Two high-speed metal spraying guns were employed to apply this coating.

$ $ $

Gasoline-Cooled Motor Has Welded 18-8 Housing

Because it was desired to use gasoline as the cooling medium for the electric motor operating a large centrifugal pump in a gasoline pipeline pumping station, the motor housing was made from welded chrome-nickel steel plates. The pumping unit is for outdoor operation without housing of any kind. The welded plate type of construction was considered necessary to make the cooling system leak-proof. The gasoline passes through a double jacket around the motor before passing into the pump. By removing heat from the outside shell of the motor, less clearance is required between rotor and stator, resulting in a higher power factor and saving in electrical energy.

$ $ $

Metal Spraying Employed

Many large power plants and public utilities have used the metal spraying process to good advantage. Turbine runners have been salvaged by spraying inlays in cavitations and pits; inlet revolving screens coated with lead, zinc and cadmium; large valves protected by zinc coatings; water tanks and structural steel members, boiler breechings, smoke stacks, and other parts of power houses coated to prevent corrosion.

$ $ $

Where operations are hazardous, workmen are to be seen using goggles, gloves, pads and aprons. All presses and operating machinery are provided with guards and suitable safety devices. Man-cooling fans are installed where heat is unusually oppressive. Incidentally, electric heat for heating furnaces is utilized wherever possible because it promotes a clean shop and is quiet.

$ $ $

The bureau of standards has cooperated with manuacturers in a proposed revision of federal specifications for wire rope. The number of types of rope covered has been increased from 19 to 44, and the specification now is believed to include practically all types needed.

$ $ $

An enamel having a composition of 60 per cent silica (SiO_2), 12 per cent sodium oxide (Na_2O) and 28 per cent lead oxide (PbO), is said to possess marked acid-resisting properties.

Specifications for Classifying Coal Are Given Approval as Tentative

APPROVAL of tentative specifications for classification of coal according to rank and grade was the outstanding achievement of the sectional committee on classification of coal announced at a meeting held in connection with the recent annual convention of the American Institute of Mining and Metallurgical Engineers. This committee, organized in 1927 under the sponsorship of the American Society for Testing Materials and rules of the American Standards association, draws its membership from various trade, technical and governmental organizations interested in the composition, production and utilization of coal.

The problem facing the committee was a difficult one The composition and properties of coal vary over an unusually wide range. Not only did the original plants from which coal was formed vary in nature and kind, but the conditions surrounding the accumulation of the vegetable material differed greatly, as did the subsequent effect of pressure, temperature and time in the geological ages that have followed the deposition of the original material. In general the oldest coals have suffered the greatest change. These are represented by the anthracites. The youngest coals, those which are just entering the coal stage of plant transformation, are called lignites. Between lignite and anthracite is a gradation of classes ranging from sub-bituminous to various ranks of bituminous coal.

Various Grades Ranked

A subdivision of the coal classification committee, known as the technical committee on scientific classification, has made an extended experimental study of the various kinds of coal found in the United States, and a similar committee in Canada has covered the coals of the Dominion. On the basis of this work the committee has developed a system of classifying coal according to rank, ranging from lignite on the one hand to anthracite on the other. Definite boundary lines and tests have been specified so that there will be no confusion in the application of this classification to the requirements of the government and industry.

Classification according to rank is based on the composition and properties of the coal and essentially on those properties which are a result of the degree of metamorphism of the coal in its progressive alteration in the natural series from lignite to anthracite. This classification virtually is determined by nature and cannot be changed by preparing or washing the coal.

Classification of coal according to grade depends primarily upon the amount and nature of impurities present, such as ash-forming constituents, sulphur and fusibility of ash. The grade of a coal also is conditioned largely by composition and physical properties, but it can be modified to some extent by methods of cleaning and preparation. Grade is expressed by the coal's actual heating value as delivered and the percentage of fixed carbon, ash, sulphur and fusibility of ash.

These specifications are approved in tentative form and represent a first approximation by the committee which will continue to work on them during the coming year and improve them to the point where they are suitable for adoption as standard specifications.

A. C. Fieldner, chief engineer of the experiment stations division, United States bureau of mines, Washington, is chairman of the sectional committee; H J. Rose, senior fellow, Mellon Institute of Industrial Research, Pittsburgh, is chairman of the technical committee on classification; and E. A. Holbrook, dean of engineering, University of Pittsburgh, is chairman of the technical committee on nomenclature.

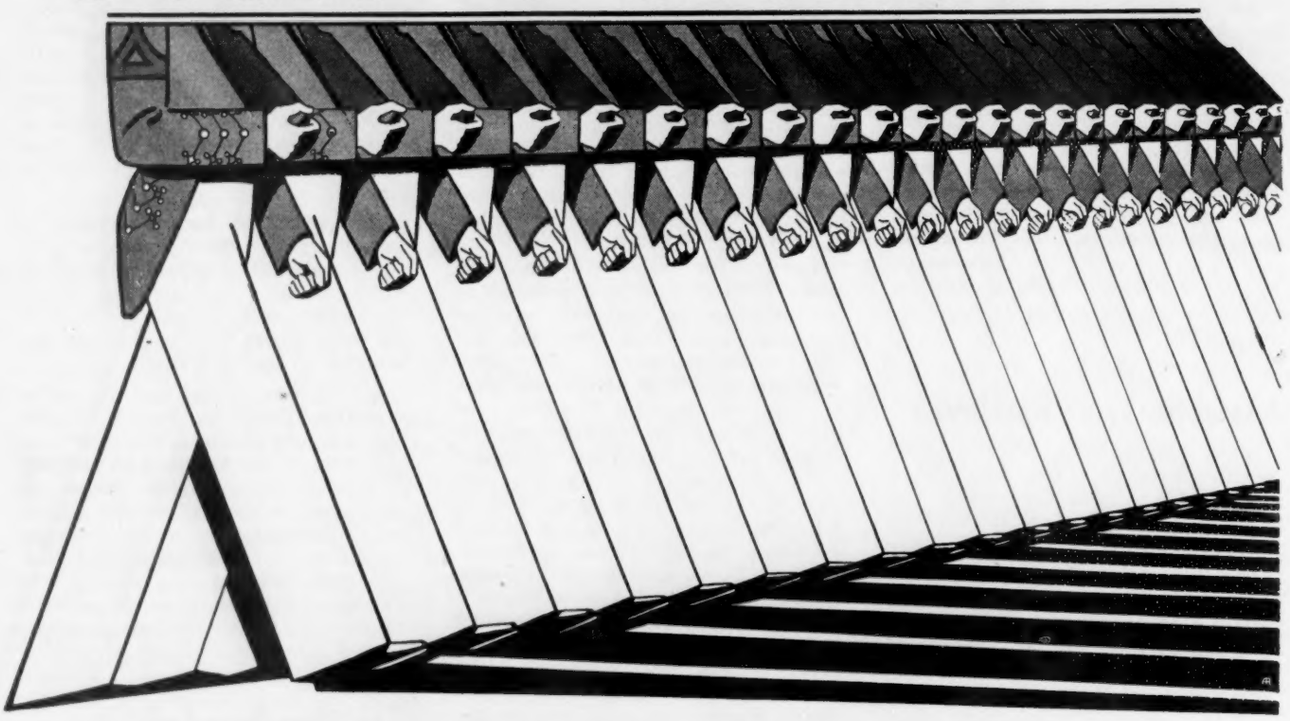
Tentative Standards for 1933 Are Presented

A.S.T.M. Tentative Standards, 1136 pages, 6 x 9 inches; published by the American Society for Testing Materials, Philadelphia, and supplied by STEEL, Cleveland, for $7 in paper and $8 in cloth, plus 15 cents postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The 1933 edition of this anual publication contains all tentative standards, methods of test and definitions of terms issued by the A.S.T.M. covering engieering materials and the allied testing field. This book contains 223 tentative standards, of which 47 are published for the first time; some 41 were revised in 1933 and are given in their latest approved form. Thirty-four of the items deal with ferrous metals, 21 with nonferrous metals, and several with refractories and similar materials.

New tentative standards for alloy steel and carbon steel castings are published for the first time. New tentative test methods include the impact testing of metallic materials, short-time high-temperature tension

LOOKING FOR UNIFORMITY



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tests and creep tests. In addition to all of the A.T.S.M. tentative standards, this edition gives proposed revisions to standards, which are published tentatively to elicit criticism before final adopton. Changes have been proposed in 46 standards.

Long 10-Inch Pipe Line Is Welded with Speed

The longest pipe line project of 1933 was the 10-inch arc welded natural gas line of the Western Gas Co., running 217 miles through semi-desert country from Douglas to Phoenix, Ariz. In spite of diffculties arising from the topography of the arid land, welding crews were able to average 55 joints per man per day.

The electrically welded pipe, supplied in 40-foot lengths by the Republic Steel Corp., Youngstown, O., and the A. O. Smith Corp., Milwaukee, had a wall thickness of 0.203-inch with plain ends beveled at 30 degrees. Backing up rings, supplied by the pipe makers, were used to facilitate welding.

Field welding was done by H. C. Price, Bartlesville, Okla., with electrodes and equipment manufactured by the Lincoln Electric Co., Cleveland. The pipe was set up on dollies and rotated beneath the arc by a chain wrench. This permitted the operator to put two beads of weld on the joint from a horizontal position and made greater speed possible. After several lengths of pipe were joined into sections, they were welded into the complete line.

In spite of the speed of this procedure, the welding passed all field tests. Tensile strength of the welded joints was shown to exceed the required 60,000 pounds per square inch. As constructed, the line was blown out and tested under 650 pounds per square inch natural gas pressure.

Economists Turn Analytical Eye on New Deal Program

The Economics of the Recovery Program, cloth, 188 pages, 5¼ x 7¾ inches, published by Whittlesey, House, McGraw-Hill Book Co., New York, and supplied by STEEL, Cleveland, for $1.50 and in Europe by the Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Seven Harvard economists have contributed to this discussion of the New Deal. The various chapters had their origin in private conversations of the authors. The common aim is to analyze, in the light of economic experience and principle, the present economic policy of the United States with reference to the recovery program. One by one the major groups of measures are taken up, and an attempt is made to determine the immediate effect that is intended to be produced, whether the methods chosen in every case are likely to produce that specific effect, and if that effect if actually produced, helps to bring about recovery.

The following discussions and authors are represented: "Depressions" by Joseph A. Schurnpeter; "Purchasing Power" by Edward Chamberlin; "Controlling Industry" by Edward S. Mason; "Helping the Worker" by Douglas V. Brown; "Higher Prices" by Seymour E. Harris; "Helping the Farmer" by Wassily W. Leontief; and "Economics Versus Politics" by Overton H. Taylor.

Data on Thread Fastenings Presented in Handbook

A 220-page handbook on thread forms and thread-locking devices in general and its own product in particular has been published recently by the engineering department of the Dardelet Threadlock Corp., 120 Broadway, New York. It is bound in soft leather and profusely illustrated with charts, diagrams and other illustrations.

The manual contains complete information on the theory of the Dardelet thread, its standardization, manufacture and application. Of interest to engineers, designers and mechanics are general data on thread fastenings; proportions and weights of bolts, nuts and screws; S. A. E. specifications and weights of steel; hardness numbers; drill sizes; inch-millimeter conversions; and data on special metals.

The information, contributed partly by other manufacturers, is set out in convenient form with an index appended for reference. The price of the book is $2 per copy.

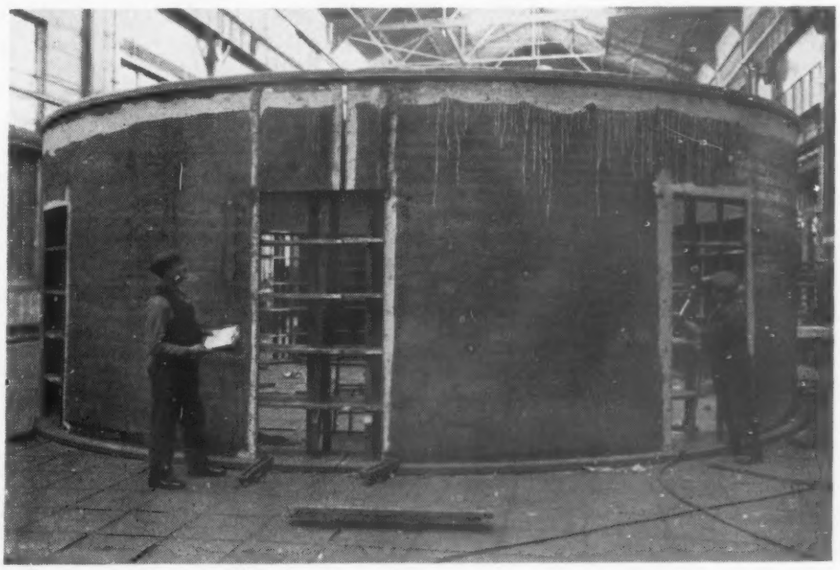
Punches and Dies for Large And Small-Lot Production

Punches and dies for sheet metal work have made possible numerous changes in shop practice and reduction in the cost of parts produced. In many cases money has been spent unwisely in making up elaborate dies before the number of pieces to be made was determined, even approximately. While a large run can absorb the cost of the most expensive tools, they should be kept as simple as possible until the output can be estimated with fair accuracy.

Such problems have led to the development of methods for making inexpensive punches and dies for short runs, a number of which are described in an article appearing in the Feb. 28 issue of *American Machinist*. Some of these punch and die assemblies permit the makers to turn out small quantities at an astonishingly low cost, which has been a boon to those needing parts in small lots.

Safety Stairway Tread Is Available in Colors

The rubber bonded aluminum oxide abrasive grain safety tread, placed on the market less than a year ago by the Norton Co., Worcester, Mass., is now available in three colors—red, green and buff—in addition to the black originally offered. The demand for colors be-



WILL HELP PUT COLORADO RIVER TO WORK: Stator frame for one of the 82,500 kilovolt-ampere hydroelectric generators at Boulder dam being assembled in the General Electric Co. shops at Schenectady, N. Y. The generators, said to be the largest ever built, will weigh over 2,000,000 pounds each

came apparent shortly after the product was introduced.

These colored treads are made in the same sizes as the black and are characterized by the same features. They have a surface which is highly non-slip even at the very nosing edge and this non-slip effectiveness is claimed to be permanent. Unaffected by weather conditions and unusually resistant to wear, the treads are suitable for both indoor and outdoor use.

Welding Saves 20 Per Cent In Weight of Vessel

Not a single rivet was used in construction of the tank barge PETER G. CAMPBELL, claimed to be the largest ship ever constructed in its entirety by electric arc welding. Features of this ship are cited in an article in the March issue of *Marine Review*, by Norman Hunter, who presented a paper on the subject before a group of marine engineers in England recently.

The ship is 179 feet long, 34 feet broad, 15 feet deep, built for a Canadian company, to be used for carrying bulk petroleum products on the Great Lakes. Welding was used in structural assembly as well as in fittings, to reduce weight to a minimum, resultant saving being estimated at about 20 per cent.

Electric Melting Digest Is Published Monthly

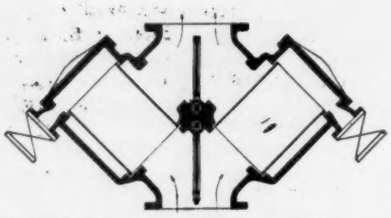
To foster greater interest in electric melting, the Detroit Electric Furnace Co., 825 West Elizabeth street, Detroit, is publishing a monthly digest of electric melting news, editorial material for which consists of reprints and abstracts from trade publications.

The March issue of the digest presents eight pages of information pertinent to the field, the leading article being on rocking indirect arc electric furnaces, written by E. L. Crosby, president of the company. In future issues, one page will be reserved for questions and answers involving melting problems.

Twin Basket Water Strainer for Steel Mill Service Is Self-Cleaning

CLEANING the water used for general service requirements around the steel mill and power house and removing scale and slag from the discharge water of rolling mills and blast furnaces are facilitated by a new type strainer which embodies a backwashing feature by means of which the strainer is cleaned while in operation without removing the baskets.

This strainer, which is manufactured by Freyn Engineering Co., Chicago, comprises two baskets placed at 90-degree angles to each other, and through which the flow of water is controlled by two swinging gate valves. The strainer basket is a cylinder, perforated to give the desired screen opening, the top and bottom of the basket being open.



Double basket strainer which is cleaned by backwashing without interfering with normal operation

Cleaned Individually

Under normal operation both gate valves are in the position shown in the accompanying illustration. Water enters at the bottom and divides, half passing through each strainer basket. To clean one of the baskets the bottom gate valve is closed, cutting off the inlet water to that basket. The by-pass valve on that basket then is opened, with the result that clean water from the discharge of the other strainer basket is forced through the first mentioned strainer basket in the reverse direction, flushing the dirt out of the baskets and through the by-pass valve. The by-pass valve then is closed and the gate opened.

To remove a strainer basket for inspection, both gate valves are closed whereupon the basket may be removed the same as with the conventional type of twin basket strainer. The swinging gate valves consist of a bronze disk, which is held against the bronze seat by the line pressure of the water. The disk is carried on a stainless steel shaft held in live rubber bushings with the result that the shaft is free to shift its center to allow the swinging gate to seat perfectly.

The strainer baskets are provided with ⅛ to ⅜-inch or larger perforations. The straining area in the baskets is considerably in excess of the area of the inlet. The strainer may be mounted in any position, horizontal, vertical, on its side, or upside down.

Market for Steel In Road Guards

(*Concluded from Page* 29)

Rust-resisting steel is being used by certain manufacturers. Plates are 10 to 12 inches wide, and up to ¼-inch thick.

Hollow posts used in some assemblies are made of No. 8 gage black strip, copper molybdenum iron, and weigh approximately 62 pounds. Manufacturers' experience with these posts is that the the post nearest the point of impact should be allowed to bend or break as soon as the steel plate is hit. This immediately brings the resiliency and strength of the rail into action.

A novel type was described in STEEL, Nov. 6, 1933, page 42, which was a 4-inch steel pipe supported on bearings mounted on wood planks, rotation of the pipe when struck by car wheels deflecting the car back to the road. Numerous other designs have appeared, all manifesting the keen study being given to this problem.

Push Improvements In Design

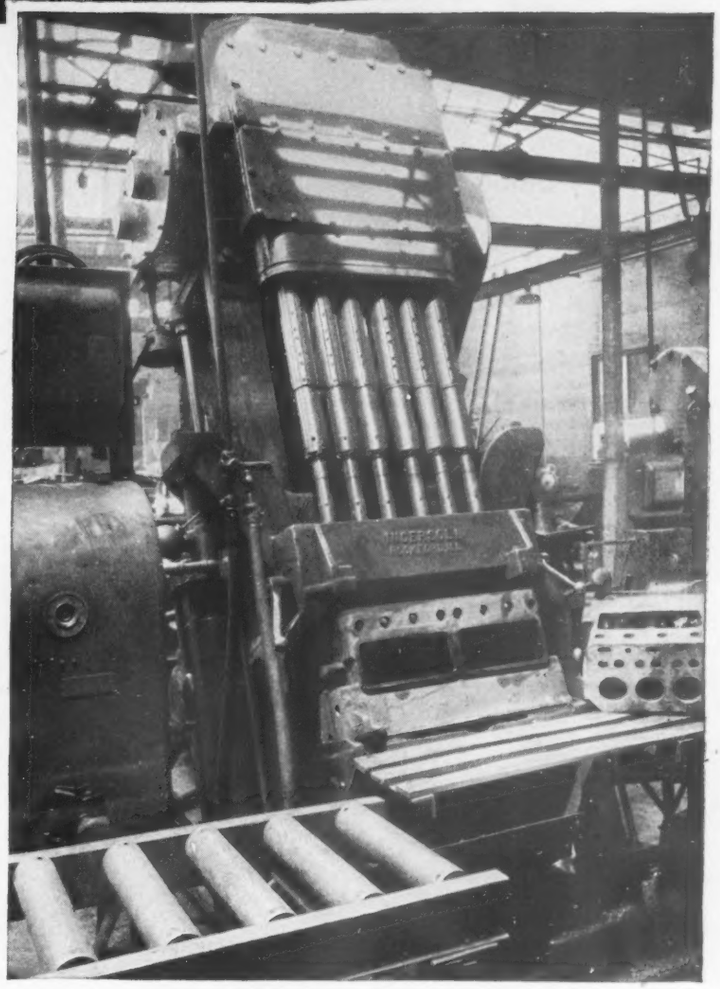
Recently manufacturers have improved their methods for employing cable for guards. The improvements are mainly in the posts. U-shaped steel posts are used, to which are bolted brackets adjustable to any height. Vision plates, painted white, are attached to the brackets. This is a patented feature. Mesh, made of heavy steel wire, in oblong pattern instead of diamond, also is being installed for road guards in many localities.

Manufacturers who have taken up the production of plate guards are not satisfied to install guards and then wait to see what happens when automobiles or trucks run into them. They have testing grounds. Old motor cars and trucks are made to run down slanting tracks full speed, tearing into the guards to see which best withstands the bombardment. Services of testing laboratories are brought into use, with scientific measuring instruments, and the findings made the subject of voluminous reports. In this way weak points are discovered and corrected before guards are erected for service.

A new industry is in the making, but more highly developed than generally supposed, with five interests manufacturing 98 per cent of the steel plate road guard output.

Economy

WITH ALLOY STEELS AND IRONS



THE decided trend toward the use of Alloy Steels and Irons in equipment and products is marked throughout the industrial field. The superiority of these metals over carbon steel and iron parts is particularly noted where improved physical properties are necessary factors.

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The Plastic Forming Of Metals

By PROFESSOR DR.-ING ERICH SIEBEL
Translated by JOHN H. HITCHCOCK

Part III—Investigations of Distribution of Deformation and Stress in Technical Forming Processes

3. Distribution of Stress in Forging and Rolling*

DETERMINING the distribution of stress in forging and rolling completely is beset with extraordinary difficulties. If, as is the case in forging, the forming is not continuous, but is produced by periodically repeated action of the forming tool, the relations become especially complicated, in the respect that the position of the bar relative to the forming tool varies during the process of working. Moreover, in the forging and rolling processes, it is almost always necessary to deal with three-dimensional conditions of stress and deformation, whereby the investigation naturally becomes more difficult. In order to simplify the relations, these forming processes first are treated only as plane (two dimensional) problems. It is assumed that the displacements of material occur only in the principal plane of deformation, and that the flow of material at right angles to this plane (spreading) can be neglected; an assumption with which sufficiently close approximation can be realized if the dimensions of the body investigated, normal to the plane of flow, are large in comparison to the body thickness.

An exact determination of the distribution of stress after the yield point has been exceeded must still be foregone, even according to this simplification. The distribution of stress in purely elastic loading promises certain possibilities of comparison[97]. Further insight into plastic deformation can be achieved by study of the mechanism of sliding. Regarding the relations, which are to be expected in the formation of the slip planes, instruction on one hand is provided by the work of H. Henky[3] and L. Prandtl.[9] On the other hand, the etching process of Fry[98] permits the formation of flow lines in elastically-overstrained steel bodies to be followed experimentally. Moreover, the recrystallization phenomena after critical cold deformation[99] promise a means of identifying the plastically-deformed region. All of these possibilities will be used in the subsequent discussion, in order to obtain a general knowledge of the stress distribution in the individual forming processes, and of the manner in which the extension of the plastically-deformed region proceeds under this distribution of stress.

Involves Two Press Dies

In drawing-out by forging, a narrow zone of the rectangular bar being forged is subjected to the compressive action of two press dies which move toward each other. In addition to the friction of the dies, the compression in this case is influenced by the cohesion of the material in the adjacent parts which do not lie between the dies. This cohesion of material has the greater importance, the narrower the dies are in comparison to the thickness of the bar. The elastic stress distribution under concentrated load was determined by F. Seewald[100] for the principal plane of symmetry, as shown in Fig. 146. As may be seen, the resulting compressive stresses, σ_y, which act in the direction of movement of the dies, decrease rapidly with increasing distance from the die surfaces. In the direction of the longitudinal axis of the bar, x-x, tensile stresses are formed even within a short distance from the points of application of load on both sides, and these tensile stresses reach a considerable magnitude over a large part of the cross section.

For plastic deformation in the case just considered, in which the dies are narrow in comparison to the thickness of the bar, it may be assumed that a system of slip lines exists, similar to that suggested by Prandtl for the penetration of a punch into a plate of not too great thickness, in which the plane of symmetry, x-x, (Fig. 147) is considered as the base. According to the method stated by Prandtl, the construction of the slip line system involves the use of Henky's thesis on the properties of the slip line system[3]. According to this thesis, two groups of conjugate slip lines exist, the lines of which are normal to each other at their points of intersection, and in which the angle between two slip lines of the same group at the points of intersection with any line of the other group remains constant over the entire paths of both lines.

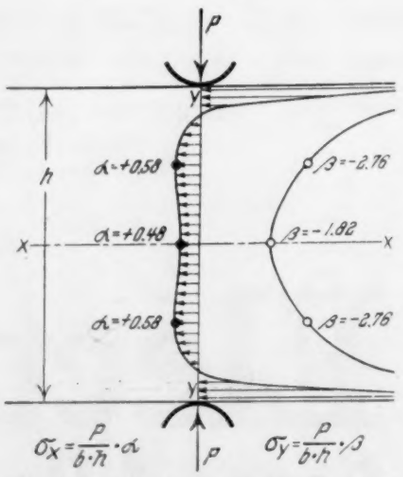

Fig. 146—Distribution of elastic stress in a rectangular beam with concentrated loads on both sides (according to Seewald)

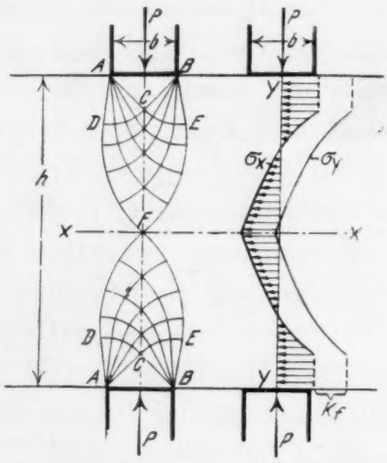

Fig. 147—Arrangement of slip planes and resulting stress distribution in a bar compressed from both sides by narrow dies

*Developed according to F. Korber and E. Siebel.[111]

[97] G. Mesmer: Vergleichende spannungsoptische Untersuchungen und Fliessversuche; Techn. Mech. Thermodyn. 1(1930)p.85.

[98] A. Fry: Kraftwirkungsfiguren im Flusseisen, dargestellt durch ein neues Aetzverfahren; Kruppsche Monatschefte 2(1921)p.117.

[99] A. Pomp: Kritische Warmebehandlung nach kritischer Kaltformgebung von kohlenstoffarmen Flusseinen; St. u. E. 40(1920)p.1261.

[100] F. Seewald: Die Spannungen und Formanderungen von Balken mit rechteckigem Querschnitt; Abhandlung aus dem Aerodynamischen Institut an der Technische Hochschule Aachen. No. 7(1927)p.11.

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The thesis permits the distribution of stress to be calculated from the assumed system of slip lines. In movement along a slip line, of course, the average compressive stress must change by an amount equal to the product of the stress at the yield point and the angle (in radians) by which the tangent to the slip line curve along which one proceeds has been rotated. Moreover, the sum of the forces acting in the x-direction must be equal to zero or equal to the friction of the dies. The distribution of stress between the dies, which is reproduced in Fig. 147, is found in this way for the case investigated. The compressive force, P, which just suffices for the extension of the plastic condition throughout the entire cross section, thereby becomes the greater, the smaller is the ratio of die width to the thickness of the bar. In the center of the cross section, tensile stresses in the x-direction also occur, in the same manner as was shown for purely elastic loading (Fig. 146).

Many Systems Available

The assumed system of slip lines is only one of a number of such systems which can satisfy the external conditions and those of equilibrium in the plastic body. The described solution is then valid as the correct one only if it yields the smallest deforming forces, in comparison to the other solutions which satisfy these equilibrium conditions. Such an investigation will not be undertaken here. Instead, an attempt will be made to show the extent to which the assumed system of slip lines agrees with the slip lines formed in mild steel by the described distribution of stress.

Two bars 1.18 inches square, which were worked cleanly on all sides, were laid tightly together, and were subjected to pressure from both sides by narrow dies 0.197-inch wide, until the inception of flow. The surface of contact between the two bars, in which a condition of plane deformation is approached, due to the described arrangement, then was etched according to Fry, by which means

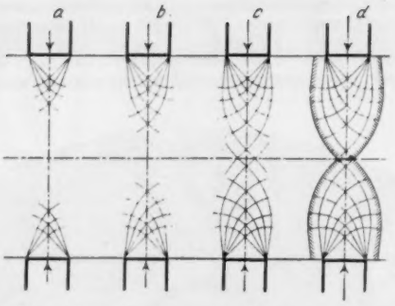


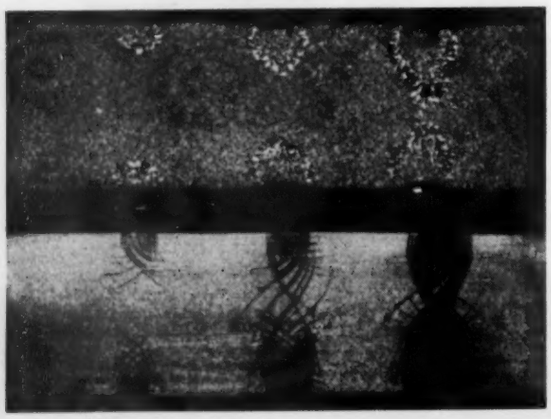
Fig. 149—Progress of slip planes in a bar compressed from both sides by narrow dies

the resulting system of slip lines was made visible. By varying the pressure, various degrees of extension of the plastically-stressed region were obtained in the individual tests (Fig. 148). The manner in which the two systems of slip lines first develop separately ahead of each die can be seen clearly. With more severe pressures, the systems of slip lines proceeding from the two outer surfaces run together in the center and finally merge*.

If the slip line system actually formed is compared with that determined upon the basis of the Henky theory, a great similarity is apparent. As the test shows, the region which is over-elastically stressed at the upper and lower edges, extends on both sides beyond the area of contact between the dies and the bar. The plastically-deformed zones, moreover, are not limited by the slip lines, ADF or BEF, (Fig. 147) radiating from the corners A and B; but the slip planes perpendicular to these lines extend beyond the lines into the remaining region which is stressed only elastically. The latter deviation is easily explained by the fact that the Henky-Prandtl theory of plastic equilibrium does not consider the elastic deformations.

If the advance of the slip lines is studied individually in the three stages of deformation, which are reproduced in Fig. 148, it is observed that a series of slip lines of one group penetrates into the region of the bar which previously was stressed only elastically. If the process is carried forward sufficiently far, further slip lines of the second group are formed which cross these points. These processes are represented diagrammatically in Fig. 149 (a and b). In this illustration it is observed that the penetration and formation of new slip lines requires an increase of the compressive force, because the angular changes, according to Henky, certainly stipulated corresponding changes in the average compressive stress along the slip lines. If the systems of slip lines proceeding from the two dies have approached sufficiently near each other, a deviation from the representation chosen in Fig. 147 is found; inasmuch as the systems of slip lines proceeding from the two dies now influence each other, so that, during further penetration, the outer slip lines of each system run parallel to the outer slip lines of the conjugate system, up to the opposite outer surfaces of the bar (Fig. 149, c and d).

*A similar test was carried out by A. Nadai[7] who determines the systems of slip lines by the method of forming striae.



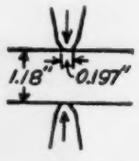


Fig. 148—Phenomena of flow in a bar of mild steel compressed from both sides by means of narrow press plates

Stressed Zones Are Visible

This conception of the mechanism of deformation can be confirmed and completed by the recrystallization phenomena which result from heating the compressed bars to 1562 degrees Fahr. By this means, the plastically stressed zones are made visible by the differing grain sizes (Fig. 148—top), in comparison with the zones which were stressed only elastically. This method of investigation, however, can indicate only relatively severe deformations, because the critical degree of deformation during which a distinct grain growth occurs lies at a compression of about 35 per cent or more. In consideration of the recrystallization phenomena, for this reason, the fact always must be kept in mind that plastic deformation still can occur even beyond the region of large grains. For the production of a good picture of recrystallization in the foregoing cases, considerably greater pressures and deformations were therefore necessary than would be used for the production of slip lines. As a whole, the phenomena of flow observed in these tests, according to Fig. 148, show a sufficient agreement with those assumed in Fig. 147 so that the stress distribution derived from the latter can be considered as a good approximation of the relations which actually exist.

If, in contrast to the case previously considered, the width of the dies is greater than the thickness of the bar, the probable formation of slip lines is like that assumed by Prandtl[8] for a plastic prism of greater width than thickness, in compression between plane dies (Fig. 150). The

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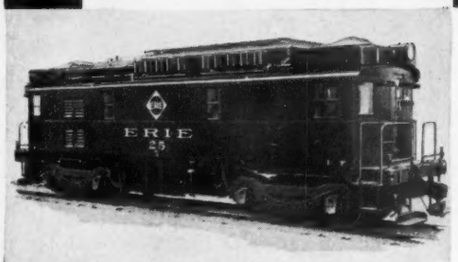

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600 hp. unit owned by C. & N. W. Ry.

600 hp. unit owned by D. L. & W. R. R.

600 hp. oil-electric railcar.

IT is a significant fact that practically all motive power purchased by railroads during 1933 was oil-electric. Operating officers are taking advantage of the savings in operating expense which the oil-electric makes possible.

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Buffalo General Elec. Co.	1	Ingersoll-Rand Co.	1
Bush Terminal Company	7	Lehigh Valley R. R.	2
Canadian National Ry.	1	Long Island R. R.	2
Central R. R. of N. J.	1	Michigan Central R. R.	4
Chicago & Northwestern Ry.	4	New York Central R. R.	39
D. L. & W. R. R.	8	Reading Company	2
Erie Railroad	5	Red River Lumber Co.	1
Foley Brothers, Inc.	1	Republic Steel Corp.	4
Ford Motor Co.	1	Rock Island R. R.	1
Great Northern R. R.	1	Union Carbide Co.	1

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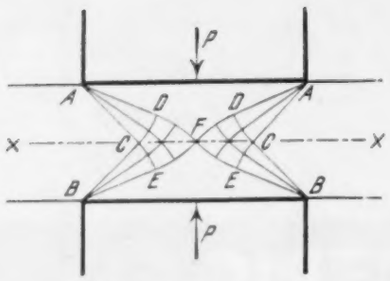


Fig. 150—Arrangement of slip planes in a bar compressed from both sides by wide dies

two groups of slip lines in each system no longer originate from the two corners of the same die, but from the opposite corners of the two cooperating dies. The influence of the cohesion of the material upon the distribution of stress in small bodies is diminished; for this reason the effect of the die friction becomes noticeable to a greater extent, the result of which action is that the material enclosed between the dies and the lines, ADFDA and BEFEB, is hindered from plastic deformation. According to the first thesis (Henky), compressive stresses in the x-direction must predominate in the core of the region subjected to compression. Further enlightenment concerning the distribution of stress within the zone of restricted deformation, however, cannot be obtained from this thesis, because the latter can be used only in the plastically-deformed region.

System Is Validated

The validity of the system of slip lines assumed for the designated case of loading is made probable by the results of compression tests which Nadai carried out on paraffin prisms, in which similar systems of slip lines were formed[7]. The results of compression tests on mild steel bars having a ratio of 1:2 between width of die and thickness of bar, reproduced in Fig. 151, show the phenomena of flow which occur under a distribution of stress lying between the two extreme cases described. In this case also, the plastically-stressed region extends on both sides beyond the contact surfaces between dies and bar. The systems of slip lines proceeding from above and below merge completely into each other, and they extend even into the region lying ahead of the dies. With more severe pressure, an enclosed plastically-stressed region exists, in which individual slip lines no longer can be distinguished. The boundary lines appear to enclose the slip line system in such a way that the latter probably has approximately the form reproduced in Fig. 152, which is developed in the same way as shown in Fig. 149.

Applying the knowledge previously gained to larger deformations and to the forging and rolling processes is not objectionable. The slip planes in drawing-out by forging, in which a length of the bar corresponding to the feed is gripped by the dies, then must be formed approximately as Fig. 153 indicates.

(To be Continued)

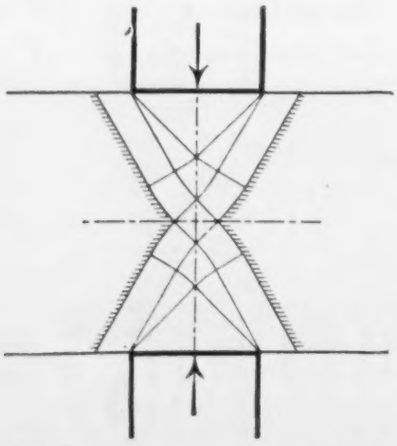


Fig. 152—Arrangement of slip planes in a bar compressed from both sides

Battledeck Floors Are Load Tested

RESULTS of steel battledeck floor loading tests conducted by the bureau of standards, Washington, are reported in the March issue of the *Technical News Bulletin* published by the bureau. The article, bearing the title "Behavior of Flat Steel-Plate Floor Under Loads," states that during recent years considerable attention has been given to applying to residences and commercial buildings methods of construction which have proved successful for other structures.

The battledeck-type floor was developed by the American Institute of Steel Construction several years ago and consists of steel I-beams to which flat steel plates are welded along the middle of the upper flange. In cooperation with the institute, the bureau made a loading test on a floor to measure its strength and to determine whether the floor behaved as a unit when loads were applied.

The test floor, having a span of 18 feet, consisted of 4-inch 7.7 pounds per foot rolled steel I-beams spaced 2 feet apart. These beams supported rolled steel plates having a width of 2 feet and a thickness of ¼-inch. Electric arc welds joined the plates and the I-beams along the middle of the upper flange of each beam.

This floor was loaded with pigs of cast iron and strain-gage and deflection readings were obtained for live loads up to 200 pounds per square foot. The load then was increased to 420 pounds per square foot with no indication of collapse. Strain-gage and deflection readings gave no indication that this floor did not behave as a unit when loads were applied. There was no visible indication that the welds either ruptured or deformed permanently. Providing the spacing of the beams does not exceed 100 times the thickness of the plate, this test indicates that for ordinary spans the entire width of the plate may be assumed effective when designing a flat steel plate floor of the type described.

A more complete account of the test work was published as RP662 in the March issue of the bureau's *Journal of Research*.

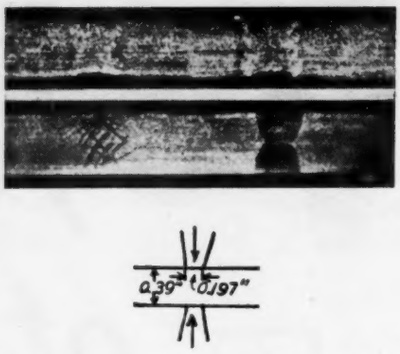


Fig. 151—Phenomena of flow in a bar of mild steel compressed from both sides by wide dies

Booklet on Bar Equipment

An attractive 16-page booklet on modern bar equipment has just been published by the International Nickel Co. Inc., 67 Wall street, New York. Applications and advantages of monel metal for use in this equipment are pointed out and some of the newer bars fabricated from this alloy are illustrated.

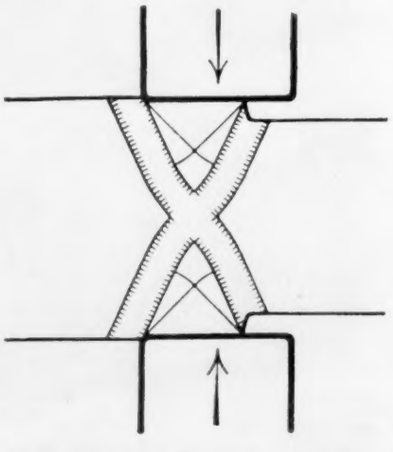


Fig. 153—Formation of slip planes during drawing-out by forging

ADVERTISING PAGES REMOVED

PROGRESS IN STEELMAKING

REHEATING furnace baffle arches built of an aggregate containing a new type binder show a life of over 12 months. The new binder with crushed or ground refractory material upon the addition of water will harden like concrete and develop high strength within 24 hours.

♦ ♦ ♦

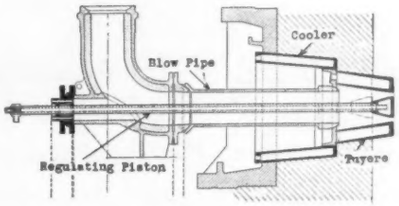
Important improvements in a new wire straightening and cutting machine include complete enclosure of the drive gears in oil housings and the use of feed and flywheel transmissions for production work and cutting of short lengths. Only a small fraction of a revolution of the flywheel is required for cutting, leaving the remainder of the revolution for feeding the wire through the unit. Roll straightening equipment is provided ahead of the rotary straightener. A combination gage wire stop and release mechanism releases the wire as it is being cut, leaving it free to drop out of the guide bar and obviating a burr on the severed end.

♦ ♦ ♦

Recent tests on a medium carbon forging steel with sulphur varying from 0.02 to 0.10 per cent in 1, 2 and 3-inch forged rounds, and on a low-carbon steel suitable for the manufacture of pipe with phosphorus varying from 0.007 to 0.08 per cent, disclose that sulphur or phosphorus has no marked detrimental effects on the metal.

♦ ♦ ♦

A compound which when spread on any substance makes it fireproof and impervious to heat is of recent development. The product is expected to find wide usage for insulating brick for heating furnaces and for fireproofing insulation on steel mill cables.



CONTROLLING the blast at the combustion zone of blast furnaces is being accomplished at a stack in Germany by the use of a regulating piston. The latter either can be a small tuyere or a solid conical plug, cooled by water flowing through the rod to which it is attached. In operation, the rod passes through the cap on the penstock, extends through the blowpipe and terminates with the water cooled plug centrally located at the nose of the tuyere. Moving the plug out or in alters the open cross section of the tuyere. With the piston in position at the front of the tuyere, the streamline motion of the blast is diverted partially into an axial motion, thus causing a widening of the combustion zone. Gradually withdrawing the piston reduces the width of the oxidizing zone; more and more the true effect of the tuyere itself predominates. The position of the oxidizing zone also can be modified by lengthening the tuyere which alters the ratio of the useful furnace section to total oxygen surface. This may be done by fitting a small tuyere to the rod and pushing the latter so far out that the attached tuyere forms an extension of the fixed tuyere. Tests disclose the maximum carbon dioxide concentration is the further from the tuyere axis, the greater the cross section of the tuyere, and hence, the greater the resulting width of the oxidizing zone. This form of piston regulator has been in use for 18 months and has resulted in an average saving of 66 pounds of coke per ton of iron over the period of a year. It also has allowed ready and rapid variation of furnace output, such as from 400 to 750 tons within 24 hours without any serious consequences arising.

♦ ♦ ♦

In adding aluminum to the steel bath for deoxidizing or alloying purposes star-shaped pieces of the metal are reported to permit quicker melting and more economy in use than bar sections because of the larger area exposed by the former to the steel. Aluminum pieces are affixed to the stirring rod for submersion in the bath by means of a hole in the center in order to prevent it from becoming detached from the rod before melting.

♦ ♦ ♦

Hard facing of various parts of equipment used in the iron, steel, coke and gasmaking industries is finding wider application. The life of such parts as water-cooled pokers for gas producers, by-product coke oven pusher shoes, knives for the hot shearing of steel, hot forming and trimming dies, rolling mill guides and drills for opening blast furnace iron notches is claimed to be greatly extended.

Flat Wire

that contains that subtle something not to be measured by gauge or gadget

Behind the scenes of advanced methods and specialized modern machines are hundreds of Washburn craftsmen, many of whom have been at their duties since Washburn-Moen days. These highly skilled artisans, schooled to the highest standard of quality workmanship, overshadow mere mechanical methods in their contribution to Washburn quality.

Every inch of Washburn Flat Wire contains the keen interest of the true craftsman in handiwork well done.

The human element, fostered by engineering methods and quality materials, results in flat wire of uniform quality, unvarying thickness, free from defects on surfaces and edges, and straight throughout the coils.

Washburn Flat Wire is obtainable in cold-rolled high or low carbon steel, in widths from $\frac{1}{16}''$ to 4″ and thicknesses from .004 to .125 and in various finishes including tinned, galvanized and bronzed. Write for quotations.

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WASHBURN

CLEAN, UNIFORM BILLETS—STRIP—RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

Engineers Discuss Advances Made in Processing Steel

TESTS recently conducted on an electrically-fired annealing furnace disclose variations in the operating temperature of only 24 degrees Fahr. in any part of the heating chamber compared to a divergence of about 200 degrees in gas-fired furnaces. This fact was brought out by W. Scott, special representative, Westinghouse Electric & Mfg. Co., Mansfield, O., at the spring engineering conference of the Association of Iron & Steel Electrical Engineers held under the auspices of the combustion engineering division at the Ohio hotel, Youngstown, O., April 11-12. Over 700 attended the opening session Wednesday evening which was devoted entirely to problems of combustion.

Temperature control has no relation to heat distribution, Mr. Scott pointed out. It is accomplished, he explained, by automatic devices actuated by a pyrometer measuring the temperature at one point in the furnace. Heat distribution is strictly a function of the furnace design and construction and has nothing whatsoever to do with the temperature control equipment.

Employs Hydrogen Atmosphere

Types of electric furnaces suitable for box annealing sheets and wide strip in protective atmospheres were discussed by A. N. Otis, industrial engineering department, General Electric Co., Schenectady, N. Y. Practically every manufacturer of silicon sheets has installed or has proposed to install an electric furnace for annealing this grade of material. Annealing silicon sheets in an atmosphere of hydrogen, Mr. Otis stated, imparts a beneficial effect to the magnetic properties of the steel.

Important factors which facilitate flatness of annealed sheets, as pointed out by Mr. Otis, include the method of circulating the atmosphere, method of supporting the stock being annealed, the rate of cooling and the final temperature to which the sheets are cooled. He pointed out that a load of 16 to 20 tons of silicon sheets can be annealed in 72 hours by the use of electric furnaces.

To anneal silicon sheets, Mr. Otis explained, requires 200 kilowatt hours per ton of steel treated, compared with 150 kilowatt hours per ton when the charge is ordinary sheets. Low-carbon coiled strip annealed at 1200 degrees requires 131 kilowatt hours per ton which compares with 188 kilowatt hours per ton for high-carbon strip in coil form.

In discussing the outlook for continuous annealing of wide strip steel Mr. Otis mentioned that an installation has been laid out but the design is limited to the annealing of thin strip. With a travel speed of 60 feet per minute, he explained, it will be possible to anneal 50 tons of 30-inch wide strip per day. The design calls for a counterflow type of heat recovery and atmosphere. Such a furnace heated to 1300 degrees Fahr. will consume approximately 65 kilowatt hours per ton of work annealed.

Utilization of batch type furnaces built in line to solve the problem of continuous heating was discussed by M. H. Mawhinney, Electric Furnace Co., Salem, O. This new principle, the speaker explained, comprises a series of similar single end batch furnaces with their fronts in line and a fast handling means outside the furnace which, in effect, ties the series of furnaces together to form a continuous producing unit. The advantages of this arrangement, as cited by Mr. Mawhinney, are the simplicity of furnace construction, flexibility of capacity since only the number of units required need be operated, high economy at all rates of production and the availability of handling machinery for repairs without intereference to production.

Discussion following the presentation of the three foregoing papers brought out the fact that high temperature at the burner of gas-fired furnaces cause spotty heating of the work. In response to a question raised regarding the temperature distribution within batch furnaces, Mr. Mawhinney pointed out that this type of furnace fired indirectly is being built to afford a range of 30 degrees Fahr. plus or minus.

Describes Tube Type Furnace

At the opening session Thursday morning, Lee Wilson, president, Lee Wilson Engineering Co., Cleveland, presented many details of design and operation of tube type annealing furnaces, which are similar in design to an electric bell-type furnace. The electric heating elements, however, are replaced with individually-fired alloy tubes which are arranged along each side of the furnace with the ends extending through the walls. Each tube is fired separately by a gas burner located at the bottom, the fuel being burned inside of the tube and exhausted at the top outlet.

Heat is transferred from the tube to the pile of sheets by radiation. The furnace consists of two parts, a base upon which the material to be annealed is piled, and the bell or furnace proper. A charge of sheets 36 x 120 inches, is brought up to a temperature of 1450 degrees along the bottom edge in from 6 to 9 hours. From 6 to 7 hours are required for the center of the pack of sheets to reach a temperature of 1400 degrees Fahr.

The bottom of the pile can be heated as rapidly as the top, the speaker pointed out, the distribution of heat from the top to the bottom of the furnace being readily obtained by regulating the burner. The time necessary for heating and soaking has been reduced to about 60 per cent of that normally required. Mr. Wilson presented curves to show that the soaking time at the edge of the pile is about the same as at the center although soaking at these two points does not occur at the same time. He mentioned that it is possible to control the cooling cycle by using the tubes as cooling mediums. Temperature drops of 50 degrees an hour can be obtained, he said, or by cutting off the gas and air the charge can be cooled by its own radiation from 8 to 10 degrees an hour.

Advantages of the tube-type annealing furnace as mentioned by Mr. Wilson, include positive control of heating and cooling cycles, positive control of heat distribution, shorter heating cycles, elimination of box and tray, positive sealing and low fuel costs.

Strength Is Important

Physical strength is the governing factor in choosing heat-resisting alloys although this qualification must be considered in the light of other elements, stated Dr. F. A. Fahrenwald, consulting engineer, Chicago. In presenting correlated technical data on heat resisting alloys, the speaker mentioned that metals and alloys flow continually but that they possess a load carrying ability which can be employed successfully.

The strongest alloys are those which contain nickel, declared Dr. Fahrenwald, although he mentioned that in working under high sulphur conditions it is desirable to have the alloys contain a high iron value. In the future, he pointed out, high temperatures will require high contents of nickel and the use of gases free from sulphur. In his opinion, higher temperatures will be used on in industry.

During the last 25 years there has been a trend toward specialized coatings on the surface of steel, according to N. E. Cook, general superintendent, galvanizing operations, Wheeling Steel Corp., Wheeling, W. Va., whose paper on "Hot Galvanizing in Connection with Sheets"

opened the afternoon session. Today, he pointed out, the trend is toward an increased efficiency and the galvanizer has had to interest himself with the various problems of heating and to correlate these data with his knowledge of fluxes, cleaning and coating.

One of the most misunderstood phases of galvanizing is the spangle, the speaker asserted. Cadmium and tin are two metals responsible for spangles on the surface of galzanized sheets which explains why these are produced when prime western spelter is used. The regular amount of spangles, in the opinion of Mr. Cook, depends upon the pickling of the sheets, the time in the bath of zinc and the degree and rate of cooling. Variation in the characteristics of the spangle can be traced to the steel base or to the treatment of the base prior to coating. In general, he stated, if the base sheet is smooth, the steel will conduct zinc and a good spangle will result.

Success of the galvanizing process depends upon many factors, chief of which are good pickling, the correct type of galvanizing machine, the metal mix which should be at the proper temperature to prevent excess formation of dross, firing of the kettle, and the furnace design.

Zinc coatings are somewhat brittle, the speaker contended, and therefore it is necessary to regulate the weight of the coating to withstand the necessary demands which are to be made on the products. When severe forming demands are to be met then light coatings are used to prevent peeling. These coatings usually contain an alloy. The purer the zinc coating the greater the length of service and the heavier the zinc coating the longer life of the sheet, Mr. Cook pointed out.

Involves Surface Treatment

In the discussion of this paper, a question from the floor invited an explanation as to why a tight zinc coat could not be applied as well to sheets rolled on 4-high cold mills as to those produced on conventional 2-high mills. Mr. Cook explained that surface conditioning probably will be required before sheets rolled on 4-high cold mills can be galvanized successfully and he mentioned that six or seven methods are being tried experimentally at present. In conclusion, Mr. Cook predicted that developments in the next few years may lead to the discarding of present day galvanizing machines on account of the wide knowledge being gained on more efficient methods of bonding and coating sheets.

Decrease in acid consumption, improvement in pickling room conditions, a reduction of metal loss ranging from 20 to 75 per cent, brighter finish of the surface of the work, and, a safety factor against over-pickling were mentioned as some of the advantages obtained by using an inhibitor in pickling solutions by H. G. Hobbs, steel service division, Grasselli Chemical Co., Cleveland. The speaker advocated the installation of a separate acid measuring tank in the pickling room in order to determine accurately the quantity of acid used for each pickling tank.

Modern pickling equipment also should include a mechanical agitator, an automatic steam control and a high pressure spray above the water line in the rinse tank particularly when rods or wire are being cleaned. In present day practice, Mr. Hobbs stated, the temperature of the acid usually is around 170 degrees Fahr., although 150 to 160 Fahr. will apply to 80 per cent of the pickling requirements.

Numerous Tanks Installed

More than 100 pickling tanks built of brick and rubber have been installed in this country during the last four years, according to J. R. Hoover, assistant manager, chemical sales division, B. F. Goodrich Rubber Co., Akron, O., in discussing "A New Technique in Acid Handling." The speaker in tracing the development of rubber-lined pickling tanks mentioned that tanks lined with rubber and sheathed with 4 inches of brick have a temperature at the rubber of about 153 degrees Fahr. with the acid at boiling temperature.

In speaking on "Blast Cleaning of Steel" W. A. Rosenberger, chief engineer, Pangborn Corp., Hagerstown, Md., mentioned that the impact per grain of abrasive blown against the surface of steel is 483,000 pounds per square inch which explains why blasting is so destructive. He emphasized that only the best grades of silica sand should be used in blasting sheets. The success of this cleansing operation depends upon the angle of contact and the air pressure. Steel sheets, he declared, have different kinds of scale on each side. One side may be sand blasted in one pass at the rate of 50 to 90 feet a minute whereas the other side may require additional passes.

In the discussion of Mr. Rosenberger's paper, a user of sand blast for cleaning sheets mentioned that small palpable dust frequently accumulates on the surface of cold rolled sheets subjected to the blasting operation, thus spoiling the work. Mr. Rosenberger advised that this difficulty could be overcome by first washing the abrasive with air in order to remove the dust and metallic slush by some separating system.

In discussing the cleaning of steels by centrifugal means, E. A. Rich, vice president, American Foundry Equipment Co., Mishawaka, Ind., emphasized that three important forces must be employed to obtain the desired results, namely, centrifugal, tangential and air-dynamic. He mentioned that by the use of a centrifugal unit, known in trade circles as the Wheelabrator, billets 4 x 4 inches can be cleaned of scale at a cost of 93 cents per ton compared with $1.34 per ton when the pickling process is used. The speaker cited one instance where a batch of 25 tons of light-gage sheets spoiled in rolling, had been reclaimed by means of the centrifugal cleaning machine.

The final session was brought to a close by the presentation of three papers dealing with refractories. Quick reflected heat is made possible by the use of insulating brick according to E. C. Lloyd, Armstrong Cork & Insulating Co., Lancaster, Pa. The use of insulating brick in flat-arch construction, which permits the arch to be placed closer to the ware, has revolutionized the design of heating furnaces, the speaker pointed out.

Mr. Lloyd cited a pair furnace lined with 9 inches of super-insulating brick and finished with high temperature cement facing which required only 4 hours to bring to the desired working temperature compared to 10 hours when an ordinary lining was used. Furthermore, he pointed out, men are able to get in the furnace after a shutdown within 14 hours compared with four days with conventional type furnaces.

New Process Employed

In discussing "The Use of Super Refractories for the Iron and Steel Industry" W. F. Rochow, Harbison-Walker Refractories Co., Pittsburgh, mentioned that de-airing by means of a vacuum may prove interesting from the standpoint of stove checker construction in the near future. Some of the uses of super refractory brick cited by the speaker included combustion chambers, electric furnaces and hot patching. He stressed the importance of high aluminum brick mentioning their ability to resist the alkali fumes usually encountered in blast furnace stoves.

One of the advantages of using insulating fire brick in furnace construction, according to M. J. Terman, refractories enginer, Babcock & Wilcox Co., Pitsburgh, is the time saved in bringing a furnace to operating temperature. This, he explained, on cold stock ranges from 25 to 85 per cent, depending on the size and type of furnace, limitations on the rate of heating the stock, burner arrangement and temperature control.

An interesting comparison of two walls of equal heat flow at thermal equilibrium, cited by the speaker, shows that at a furnace temperature of 2800 degrees Fahr., the insulating fire brick wall has a thermal capacity of 8750 B.t.u. per square foot, whereas the heavy wall backed up with insulation has 91,500 B.t.u. per square foot, a ratio of 1:10.

LUKENS CROMANSIL STEEL

IN WELDED ENGINE BED AND ENGINE CRANKCASE ON THE *Burlington "Zephyr"*

"It Had To Have Quality
—The Steel Is Lukens Cromansil
—the Welding Is Lukenweld"

Welded steel engine bed, fabricated from Lukens Cromansil Steel by Lukenweld, Inc., division of Lukens Steel Company.

"It Had To Have Quality
—the Steel Is
Lukens Cromansil
—the Welding
is Lukenweld"

Welded steel engine crankcase used in the Winton engine which powers the Burlington's "Zephyr". It was fabricated from Lukens Cromansil by Lukenweld, Inc., division of Lukens Steel Company.

Believed to be the first use of a welded engine bed on a motive power unit in main line railway service in America, the Burlington Railroad's high-speed stream-lined train, the "Zephyr", is equipped with a welded engine bed fabricated from Lukens Cromansil Steel.

This high strength steel, in conjunction with efficient design and fabrication by welding, resulted in an unusually high ratio of load-carrying capacity to engine bed weight. The bed weighs only slightly more than 3 tons, and supports a 30-ton load consisting of the train's engine and generator and forward half of the power car.

In addition, the crankcase of the Winton full Diesel engine on the "Zephyr" is of welded construction, also fabricated from Lukens Cromansil Steel. The engine, without generator and auxiliaries, weighs only about 22 lbs. per h.p.

Because of its superior physical properties, Lukens Cromansil Steel offers new possibilities of weight-saving without the slightest sacrifice of safety. May we send you complete data? Write us.

LUKENS STEEL COMPANY

FIRST TO ROLL BOILER PLATE IN AMERICA

COATESVILLE, PENNSYLVANIA

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

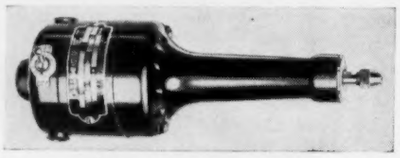
Recording Potentiometer—C. J. Tagliabue Mfg. Co., Park & Nostrand avenues, Brooklyn, N. Y., recently introduced a recording potentiometer that is photoelectrically balanced. A beam of light is reflected by a galvanometer upon a photocell, current from which is amplified to close a relay. Shutters intermittently operated in front of the cell, detect deflections of the light beam, and synchronized electric contacts control the motion of the contact carriage back and forth across the chart and slide-wire of the potentiometer. Thus the potentiometer is balanced electrically and when the light beam is at the center of the shutters, the mechanism records the position of the carriage and turns a multiple switch to a new position. The unit has a black enameled case for universal mounting; records from one to twelve temperatures and operates on 110 or 220 volts, 60 cycles.

♦ ♦ ♦

Rustproofing Machine — Detroit Sheet Metal Works, 1300 Oakman boulevard, Detroit, recently developed a rustproofing machine that expedites the treatment of many small odd-shaped pieces required for a wide variety of purposes. The unit is such that it can be attached easily to the apparatus that cleans or prepares the parts for the rustproofing operation. Work is conveyed to the treating chamber in open mesh baskets that are placed on a loading table which is an integral part of the machine. Each basket is pushed into the cabinet by hand, after which a hand lever is depressed to close the doors. This also starts the flow of rustproofing as well as of the compressed air which atomizes the fluid. As soon as the pieces have received their rustproof film, the operator again pushes the lever, thus shutting off the atomizer and opening the delivery and discharge gates simultaneously.

♦ ♦ ♦

Hand Grinder—Dumore Co., Racine, Wis., is marketing a new light weight, high-speed hand grinder for use by pattern, machine and engraving shops, and in toolrooms. Weight is only 1 pound and 10 ounces. A 1/40 horsepower universal type motor which can be used on either alternating or direct current furnishes power. A speed of 15,000 revolutions per minute is attained.



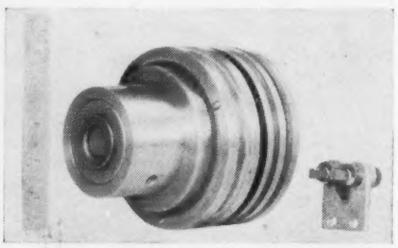
Dumore high-speed hand grinder is powered with universal motor

♦ ♦ ♦

Automatic Manometer-Regulator—Meriam Co., 1955 West 112 street, Cleveland, is marketing a new type of manometer fitted with automatic electric control features. It is adaptable to a wide variety of direct and differential control uses for pumps, liquid levels in tanks and sprinkler systems, and for maintaining gas pressure and flow between close limits; for starting and stopping the flow in two pipes alternately for special purposes. Other uses suggested are the automatic starting of a reserve pump in case of a failure of the regular unit to operate, the production of alternate pressure and vacuum in a closed vessel, or for electrically-operated remote control of steam valves, etc. It has the additional advantage of providing a visible reading of performance at all times.

♦ ♦ ♦

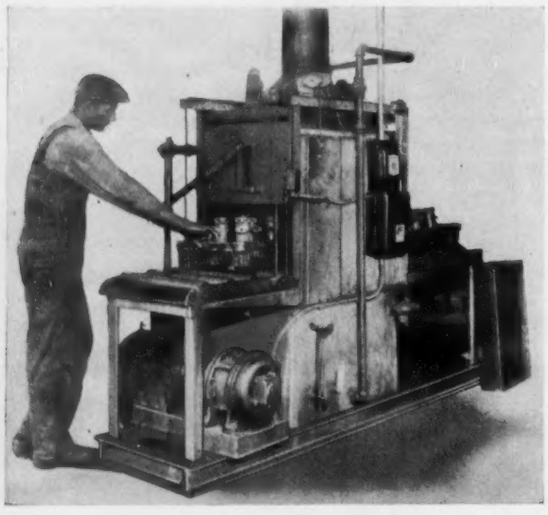
Combination Clutch-Brake Unit—Magnetic Mfg. Co., Milwaukee, is announcing a new combination clutch-brake unit only 5 inches in diameter. This mechanism, shown herewith, has a conservative torque rating in the brake of 40 inch pounds and in the clutch of 80 inch pounds. It can be arranged for maximum bore of ⅞-inch and can be operated from any source of direct-current up to and including 250 volts. The brake is the mechanical safety type, spring actuated, thus assuring positive stopping in event of any interruption in the electric circuit. Similar clutch-brake combinations of both smaller and larger diameter are now available and should have wide application in the industrial field.



Combination clutch-brake unit designed by Magnetic Mfg. Co.

♦ ♦ ♦

Water Booths—DeVilbiss Co., Toledo, O., is announcing a new line of water booths designed to prevent the discharge of heavy, solid sticky paint residues to the outside of buildings. These booths may be operated in neighborhoods where the use of standard or blower type booths would be prohibited. Where vitreous materials are sprayed, this type of structure permits the control of objectionable dust and the reclamation of solids. Opposed direction sprays first are directed with and then set against air flow to secure maximum efficiency of solids separation by sprays. Eliminator plates,



RUSTPROOFING machine developed by Detroit Sheet Metal Works, expedites treatment of many small odd-shaped pieces required for a variety of purposes. The fluid is atomized by compressed air

equivalent to six 10-degree angles, remove free water from discharged air at low velocity.

♦ ♦ ♦

Ammeters — Columbia Electric Mfg. Co., 4519 Hamilton avenue, Cleveland, announces that it now is in a position to supply its ammeters for readings up to 800 amperes instead of only up to 400 amperes as formerly. Instruments up to 400 amperes are suitable for both direct and alternating current. The new 800-ampere size operates either on direct or alternating current but not on both. All instruments, however, give readings without interrupting the circuit, by closing movable "tongs" around the conductor. Neither current transformers nor shunts are required.

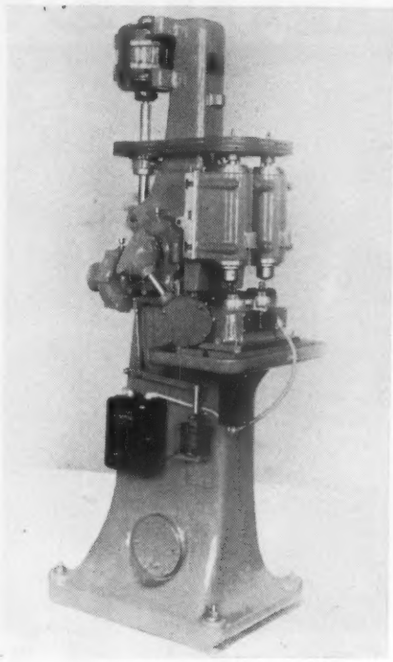
♦ ♦ ♦

Rubber-Insulated Cable—General Electric Co., Schenectady, N. Y., is marketing three new types of rubber-insulated cable. Type GE-R359 is designed to operate at a maximum temperature not exceeding 75 degree Cent. It is recommended for insulating cables for station, apparatus, transformer lead, motor lead, and power applications where a cable is required to be insulated with a compound that will withstand much higher temperatures than the standard grade of rubber compounds previously available. The second type employing a moisture-resisting compound, is designed for use where cables must operate in wet locations. The third new compound is corona and moisture resisting. It is recommended on cables for high voltage transmission, distribution, station, apparatus, etc., where a corona-resisting, high tension, nonleaded or leaded cable is required.

♦ ♦ ♦

Profile Milling Machine—Automatic Machine Co., Bridgeport, Conn., recently introduced a profile milling machine, shown herewith, embodying an ingenious adaptation of a standard machine tool to a special single purpose manufacturing unit. The design was developed for cutting elongated grooves, tapered in width and depth, in chrome molybdenum clutch disks but is readily adaptable to any work of a similar nature.

Cutters used are of the fish tail type running 2400 revolutions per minute and held in precision collet chucks, with the up and down location adjustable by means of a finely threaded screw running through to the top of the spindle. A two horsepower motor at the top rear of the



Profile milling machine developed by Automatic Machine Co.

column drives a vertical power shaft on which the V-belt drive pulley for the spindles is mounted. At the bottom of the power shaft is a worm and worm gear in which is incorporated a clutch actuated by a solenoid. A horizontal shaft is driven through the clutch, this shaft in turn driving through another worm and gear to a cam shaft on which is mounted a cam that controls the vertical movement of the slide holding the cutter spindles.

In the design for the four-groove disk the work holding spindles revolve once to four revolutions of the cam shaft, and with the six-groove disk the work spindle revolves once to six revolutions of the cam shaft. At the completion of one revolution a limit switch is engaged by a knob on the left-hand work spindle, operating the solenoid to disengage the clutch and stop the work operations.

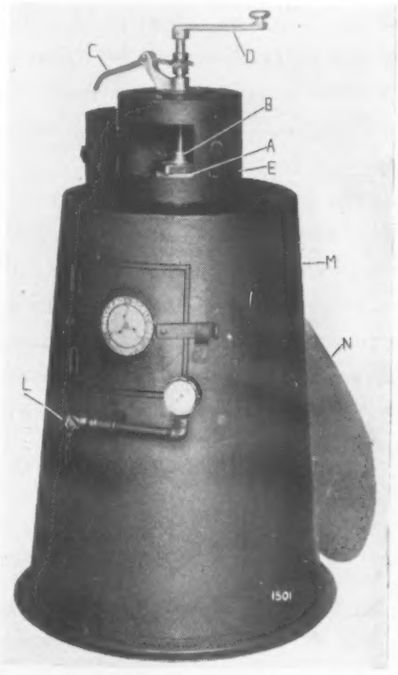
♦ ♦ ♦

Blowers, Vacuum and Gas Pumps—Roots-Connersville Blower Corp., Connersville, Ind., now is furnishing some of its blowers, vacuum pumps and gas pumps connected through a variable speed drive to a constant speed motor. The equipment arranged in this way is especially suitable for those industries where seasonal peaks or processing technique makes changes in volume advantageous or necessary. Variable speed drives also are being used in connection with cycloidal rotary pumps.

♦ ♦ ♦

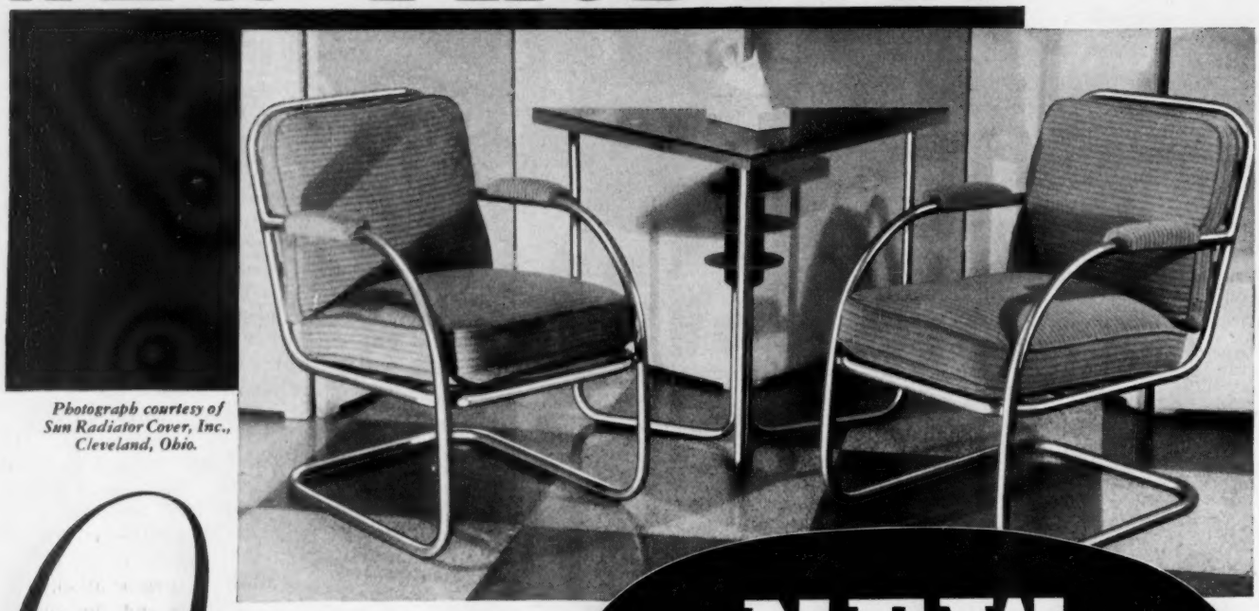
Abrasive Blast Testing Unit—Macleod Co., 2232-40 Bogen street, Cincinnati, recently introduced a machine that employs an abrasive blast to test structural materials. While the unit was designed primarily for testing the wearing quality of building and paving stone, concrete, tile, brick, clay and similar materials it can be used with equal facility on metals. In the machine the test pieces can be subjected to the attack of different grades and kinds of abrasives such as sand and carborundum or steel grit.

Referring to the illustration below, samples *A* in the form of cubes, 3 inches square, are clamped one at a time over a 2½-inch diameter aperture between the main body of the machine and a small circular chamber *E* on top of it. This is done by means of clamping head *B*, crank *D* and the clamp lifter *C*. In this position the full force of the blast from the nozzle, which is directly beneath the opening, is directed against the test piece. Discharged abrasive drops back into the hopper in the base of the machine and is used so long as it retains its sharp cutting edges. Samples, after they have been acted upon, give dependable information on distribution of soft and hard layers, occlusions, pores, cracks, etc.



Macleod materials testing machine employs abrasive blast

NEW PRODUCTS



Photograph courtesy of Sun Radiator Cover, Inc., Cleveland, Ohio.

Make NEW MARKETS

Many manufacturers today are face to face with a serious situation. They make a good product and sell it at a price that is right. They sell to about every possible prospect. New users are not coming into the market, and old users are not buying because the old product is still serviceable.

If this is your problem, let us suggest a solution that many others have tried and found successful. Make your old product obsolete. Redesign it. Make it more beautiful—more useful—more economical—more profitable to the user—but whatever you do—make it so different from your present product that both old and new buyers will want the new. Then you have made a market.

New designs call for tubing, the strongest structural form available for the weight involved—accurate, smooth Electrunite Mechanical Tubing—Enduro Stainless where lasting beauty is required—or strong, rigid Rail Carbon Tube where exceptional strength and rigidity are necessary.

You will find tubing today in places never dreamed of only a short time ago—in comfortable furniture for homes, clubs and hotels, in better agricultural implements, in automobile seats of radical design, and in machinery of every kind.

A Steel and Tubes representative will be glad to tell you about the many kinds of tubing that are available for your needs. Write today.

STEEL AND TUBES, INC.

WORLD'S LARGEST PRODUCER OF ELECTRICALLY WELDED TUBING

CLEVELAND • • • OHIO

A UNIT OF REPUBLIC STEEL CORPORATION

Quick Action on Contracts Lifts Steel Rate

Production Rising in All Major Districts—Additional Price Advances Announced—75,000 Tons of Rails and Fastenings Placed

RESPONDING briskly to an inflow of April specifications on heavy contracts placed before price advances go in effect this week, steelworks operations last week rose 3 points to 51 per cent.

Sharp gains were made in the major producing districts, with Pittsburgh up 3 points to 39 per cent; eastern Pennsylvania 3½ to 38½; Youngstown 2 to 57; and Chicago 1½ to 50. Wheeling was up 7 points to 69; Cleveland 2 to 69. Birmingham remained at 52; Buffalo 50, while Detroit was down 6 points to 82, and New England 4 to 78. Youngstown operations this week are scheduled at 59 per cent, and Pittsburgh at 40.

Steelmakers see ahead a period of steadily mounting production. Some stopped taking contracts last week several days prior to the effective dates for new prices, fearing a shortage of skilled labor before July. Automotive, railroad and miscellaneous demands continue strongly upward.

Steel Builds Tonnage by Delaying Real Effective Date of New Price Phase

In summary, recent events in the steel industry mean: By giving ten days notice of price increases and throwing wide open their order books, steelmakers have sacrificed no less than $25,000,000. This is based on finished steel output with the industry operating around 50 per cent, and the difference between STEEL's composites of the old and new finished steel prices.

As an offset to this, the industry has built up tonnage by giving consumers the opportunity to cover their requirements three to four months ahead, meantime to make their own adjustments. The industry has not antagonized the government, because finished steel prices even at the new level still are $4.98 a ton below the 1926 average—the President's mark for commodities. And labor benefits through the return to the 1929 wage standard April 1—three months ahead of the time when steelmakers gain, except through increased tonnage.

Price advances applying this week, or immediately in view, practically blanket all iron and steel products. In addition to the increases announced in STEEL last week, stock tin plate is up $7 a ton, structural rivets $5, sheet piling $3. Light rails are up $3 a ton, and an increase is expected in the $36.37½ price on standard rails, quoted to the government last fall, and which expired April 15. A rise of $7 a ton is expected shortly on tubular products, and $10 on electrical sheets. While some producers raised wire $3 effective April 12, one large manufacturer filed an increase of only $2, for April 20.

Week's Rail and Accessories Orders 75,000 Tons; Shape Awards Heavier

Lake Superior iron ore producers have quoted last year's prices on an inquiry for 50,000 tons from the Ford Motor Co. With a 10 per cent wage increase for Great Lakes seamen, larger crews, and higher coal prices, transportation costs this year will be up 25 per cent. A miner's strike in Alabama is reducing coal output, and by-product coke there has been raised 50 cents a ton. Scrap prices are unchanged following recent heavy buying.

Approximately 75,000 tons of rails and track accessories were placed during the week, including 20,000 tons of rails for the Great Northern; 35,000 tons of rails and 15,000 tons of fastenings for Baltimore & Ohio; 1000 tons of rails and 600 tons of fastenings for Pere Marquette. New York, New Haven & Hartford is expected to inquire shortly for 25,000 tons of rails and 10,000 tons of accessories. New York Central has contracted for 10,500 tons of miscellaneous steel products; Norfolk & Western for 4500 tons.

Structural shape awards for the week, 16,827 tons, compare with 6021 in the preceding week. Price protections for 60 days on specific jobs have brought out many new projects. The Solvay Process Corp. is taking bids for a plant at Baton Rouge, La., requiring 5000 tons.

STEEL'S London correspondent cables daily average pig iron output in Great Britain in March rose 13.4 per cent over February; steel, 9.4 per cent.

With the new finished steel prices now in effect or about to become effective early this week, STEEL'S finished steel composite is up $3.80 to $54.90; the iron and steel composite has advanced $2.37 to $34.77, while the scrap index holds at $12.21.

NOTE—As practically the entire list of iron and steel prices has been changed in STEEL this week, reflecting the recent advances now in effect, or going in effect early this week, the asterisks which customarily have been used to denote price changes have been eliminated. The use of asterisks to indicate individual changes will be resumed next week.

COMPOSITE MARKET AVERAGES

	April 14	April 7	One Month Ago March, 1934	Three Months Ago Jan., 1934	One Year Ago April, 1933	Ten Years Ago April, 1924
Iron and Steel Composite	$34.77	$32.40	$32.40	$32.42	$28.16	$42.33
Finished Steel Composite	54.90	51.10	51.10	51.10	44.94	65.93
Steelworks Scrap Composite	12.21	12.21	12.30	11.24	7.23	14.58

A COMPARISON OF PRICES

	April 14, 1934	Mar. 1934	Jan. 1934	April 1933
Finished Material				
Steel bars, Pittsburgh	1.90	1.75	1.75	1.60
Steel bars, Chicago	1.95	1.80	1.80	1.70
Steel bars, Philadelphia	2.19	2.04	2.04	1.91
Iron bars, Terre Haute, Ind.	1.60	1.60	1.60	1.65
Shapes, Pittsburgh	1.85	1.70	1.70	1.60
Shapes, Philadelphia	2.05½	1.90	1.90½	1.65
Shapes, Chicago	1.90	1.75	1.75	1.70
Tank plates, Pittsburgh	1.85	1.70	1.70	1.55
Tank plates, Philadelphia	2.03½	1.88½	1.88½	1.49½
Tank plates, Chicago	1.90	1.75	1.75	1.70
Sheets, No. 10, hot rolled, Pitts.	2.00	1.75	1.75	1.55
Sheets, No. 24, hot ann., Pitts.	2.65	2.25	2.25	2.00
Sheets, No. 24, galvan., Pitts.	3.25	2.85	2.85	2.65
Sheets, No. 10, hot rolled, Gary	2.10	1.85	1.85	1.70
Sheets, No. 24, hot anneal., Gary	2.75	2.35	2.35	2.10
Sheets, No. 24, galvan., Gary	3.35	2.95	2.95	2.75
Plain wire, Pittsburgh	2.35	2.20	2.20	2.10
Tin plate, per base box, Pitts.	5.25	5.25	5.25	4.25
Wire nails, Pittsburgh	2.60	2.35	2.35	1.85
Semifinished Material				
Sheet bars, open-hearth, Youngs.	30.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	30.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	29.00	26.00	26.00	26.00
Wire rods, Pittsburgh	38.00	36.00	36.00	35.00

	April 14, 1934	Mar. 1934	Jan. 1934	April 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.76	19.26	19.26	16.26
Basic, Valley	18.00	17.00	17.00	14.00
Basic, eastern, del. eastern Pa.	19.76	18.76	18.76	14.19
No. 2 foundry, del. Pittsburgh	19.26	18.76	18.76	15.76
No. 2 foundry, Chicago	18.50	17.50	17.50	15.50
Southern, No. 2, Birmingham	14.50	13.50	13.50	11.40
No. 2X, Eastern, del. Philadelphia	20.63	19.63	19.63	13.76
Malleable, Valley	18.50	17.50	17.50	14.50
Malleable, Chicago	18.50	17.50	17.50	15.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.04
Gray forge, del. Pittsburgh	18.88	18.38	18.38	15.63
Ferromanganese, del. Pittsburgh	90.24	90.24	90.24	73.24
Scrap				
Heavy melting steel, Pittsburgh	$14.25	14.30	13.05	9.90
Heavy melting steel, eastern Pa.	11.50	11.70	11.65	6.90
Heavy melting steel, Chicago	11.75	12.00	10.45	6.55
No. 1 wrought, eastern Pa.	12.25	12.75	12.75	7.35
No. 1 wrought, Chicago	10.90	10.80	9.45	5.50
Rails for rolling, Chicago	12.75	12.75	11.25	8.50
Coke				
Connellsville, furnace, ovens	3.25	3.35	3.60	1.75
Connellsville, foundry, ovens	4.60	4.25	4.25	2.25

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	2.00c
Gary, base	2.10c
Chicago, del.	2.13c
New York, del.	2.33c
Philadelphia, del.	2.29c
Birmingham, base	2.15c
St. Louis, del.	2.32c
F.o.b. cars, dock, Pacific ports	2.67½c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.65c
Gary, base	2.75c
Chicago, del.	2.78c
Detroit, del.	2.85c
New York, del.	2.98c
Philadelphia, del.	2.94c
Birmingham, base	2.80c
St. Louis, del.	2.97c
F.o.b. cars, dock, Pacific ports	3.35c

GALVANIZED No. 24

Pittsburgh, base	3.25c
Gary, base	3.35c
Chicago, del.	3.38c
Philadelphia, del.	3.54c
New York, del.	3.58c
Birmingham, base	3.40c
St. Louis, del.	3.57c
San Francisco, f.o.b. cars, dock	3.95c

TIN MILL BLACK No. 28

Pittsburgh, base	2.85c
Gary, base	2.95c
St. Louis, del.	3.17c

COLD ROLLED No. 10

Pittsburgh, base	2.55c
Gary, base	2.65c
Detroit, delivered	2.75c
Philadelphia, del.	2.84c
New York, del.	2.88c

COLD ROLED No. 20

Pittsburgh, base	3.15c
Gary, base	3.25c
Detroit, delivered	3.35c
Philadelphia, del.	3.44c
New York, del.	3.48c

ENAMELING SHEETS

Pittsburgh, No. 10	2.60c
Pittsburgh, No. 20	3.20c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

Tin plate, coke base contract	$5.25
Do., stock	4.90
Long ternes, No. 24 unassorted	3.65c

Steel Plates

Pittsburgh, base	1.85c
New York, del.	2.13c
Philadelphia, del.	2.03½c
Boston, del.	2.25c
Buffalo, del.	2.08½c
Chicago, base	1.90c
Cleveland, del.	2.03½c
Birmingham, base	2.00c
Coatesville, base	1.95c
Sparrows Pt., base	1.95c
Pacific Coast, f.o.b. cars, dock	2.40c
St. Louis, del.	2.12c

Structural Shapes

Pittsburgh, base	1.85c
Philadelphia, del.	2.05½c
New York del.	2.10½c
Boston, del.	2.23½c
Bethlehem, base	1.95c
Chicago, base	1.90c
Cleveland, del.	2.03½c
Buffalo, base	1.90c
Birmingham, base	2.00c
Pacific Coast, f.o.b. cars, dock	2.40c

Bars

SOFT STEEL

Pittsburgh, base	1.90c
Chicago base	1.95c
Birmingham, base	2.05c
Buffalo, base	2.00c
Cleveland, base	1.95c
Detroit, del.	2.05c
Pacific Coast ports cars, dock, c.i.f.	2.45c
Philadelphia, del.	2.19c
Boston, del.	2.30c
New York, del.	2.23c
Pitts., forg. qual.	1.90c-2.40c

RAIL STEEL

To Manufacturing Trade

Pittsburgh	1.80c
Chicago	1.85c
Cleveland	1.85c
Gary, Ind.	1.85c
Buffalo	1.90c

IRON

Terre Haute, Ind. base	1.60c
Philadelphia, base..	1.74c
Pittsburgh, refined..	2.75c-7.50c

REINFORCING
New billet, cut lengths, carlots

Pittsburgh	1.90c
Chicago, Gary, Buffalo, Cleve., Birm., Young	1.95c
Gulf ports	2.30c
Pacific coast ports	2.45c
Philadelphia, del.	2.79c

Rail Steel

Pittsburgh, base	1.75c
Chicago, Buffalo, Cleveland, Birm., Young	1.80c
Gulf ports	2.15c
Pacific coast ports	2.30c

Wire Products □ □

NOTE — The following prices became effective April 12, on filings by some producers. A counter filing by a leading interest, reducing the advance on many items, will become effective April 20.

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland
(Per 100-lb. keg)

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
Do., 16 gage and finer..	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.10c
Annealed fence wire	2.50c
Galvanized fence wire	2.85c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.35c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.35c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-FinishedCarbonBars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Chicago, Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars □

Hot Rolled

Pittsburgh, Buffalo, Chicago, Massillon, Canton	2.55c
Bethlehem	2.60c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo.	0.50
4600 .20 to .30 Mo. 125-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon van.	0.95
9250.....carbon base plus extras	

Strip and Hoops □

Hot strip to 23⅛-in. Pittsburgh	2.00c
Do., Chicago	2.10c
Do., del. Detroit..	2.20c
Do., del. Phila.	2.29c
Do., del. N. Y.	2.33c
Cooperage hoop, Pittsburgh	2.10c
Do., Chicago	2.20c
Cold-rolled strip, Pitts., Cleve.	2.80c
Worcester	3.00c

Rails, Track Material □

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pitts., Chi...	$32.00
Do., reroll. qual....	$31.00
Angle bars, mills....	2.55c
Spikes, R. R. base..	2.40c
Track bolts, base....	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS

All sizes, cut thread, lag Screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts 70 off

Tire bolts	60 off
Stove bolts, 70-25-10 off in pkgs.; 83 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller,	70 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in., smaller	85 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	75-10 off
Upset, larger than 1-in.	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	3.00c
Struc., c. l., Chicago	3.10c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila..	6.25 off

Cut Nails, Piling □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	$3.05
Do. less than 5 kegs; no discount on size extras	$3.20
Steel piling, Pittsburgh	2.15c
Steel piling, Chi., Buff	2.25c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

In.	Blk.	Gal.
Steel		
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel		
2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel	
⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½
Iron	
⅛—1½-inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.	

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¾—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Cold Drawn			
2—2¼	27	3¼—3½	41
2½—2¾	34	4	43
3	38	4½, 5, 6	36

(On 1—1¾-inch sizes mechanical tubing dis. apply.)

Hot Rolled			
2—2¼	33	3¼—3½	47
2½—2¾	40	4	49
3	44	4½, 5, 6	42

Quantity discounts: Carload and more gets preferentials of two 5%; 2000 to 999 pounds, 10 points off base and one 5%, under 2000 pounds, 15 points under base and one 5%.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$36.00-37.00
4-in., Birmingham..	39.00-40.00
4-in., Chicago	47.00-48.00
6 to 24-in., Chicago	44.00-45.00
6-in., & over, east. fdy.	40.00
Do., 4-in.	43.00

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base....$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, 5 higher.

Semifinished Steel □

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$29.00
Philadelphia	34.30
Forging, Pitts., Chi.	34.00

SHEET BARS

Pitts., Cleve., Young.	30.00
Chicago	30.00
Canton, O.	30.00

SLABS

Pitts., Cleve., Young.	29.00

WIRE RODS

Pitts., Cleveland	38.00
Chicago	39.00

SKELP

All grades, Pitts. and Chicago	1.70c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur†	$3.25- 3.85
Connellsville fdry.	4.60
Connell. prem. fdy.	5.35
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

†Lower prices for yearly contracts.

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	10.50
St. Louis, del.	9.25
Birmingham, ovens	5.50
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	$0.19
90 per cent benzol	$0.19
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb. f.o.b. New York

Phenol (200 lb. drums)..	0.163c
Do. (100 lbs.)	0.173c

Eastern Plants, Per Pound, In Barrels

†Naphthalene flakes and balls	6.00

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.25

†Western prices ½-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Sparrows Point, Md.	19.50	.....	19.00	.....
From Swedeland, Pa., del. to Phila.	20.26	20.76	19.76	.....
From Bethlehem, del. to Brooklyn	21.77	22.27	.....	.....
From Bethlehem, del. to Newark, N. J.	20.99	21.39	.....	.....
Basing Point:				
Everett, Mass.	19.50	20.00	19.00	20.50
From Everett, del. to Boston	20.00	20.50	19.50	21.00
Basing Point:				
Buffalo	18.50	19.00	17.50	18.50
From Buffalo, del. to Boston	20.00	20.50	19.50	21.00
Basing Points:				
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
From Neville Island, Pa., del. to Pittsburgh district	(Neville Island base, plus 63c to $1.13 switching charges)			
Basing Points:				
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, O.	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
From Detroit, del. to Saginaw, Mich.	20.60	20.60	20.10	21.10
From Cleveland, del. to Akron, Canton, O.	19.76	19.76	19.26	20.26
From Toledo, del. to Mansfield, O.	20.26	20.26	19.76	20.76
Basing Point:				
Jackson, O.	20.25	20.25	19.75	.....
Hamilton, O.	18.50	18.50	18.00	19.00
From Hamilton, del. to Cincinnati	19.51	19.51	19.01	20.01
Do., del. to Indianapolis	20.77	20.77	20.27	21.27
Basing Points:				
Duluth	19.00	19.00	.....	19.50
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	19.00	18.00	.....
From Duluth, del. to St. Paul	20.94	20.94	.....	21.44
From Chicago, del. to Milwaukee	19.50	19.50	19.00	20.00
From Chicago, Toledo or Detroit, del. to Muskegon, Mich.	21.40	21.40	20.90	21.90
From Granite City, del. to St. Louis	19.00	19.50	18.50	.....
Basing Point:				
†Birmingham, Ala.	14.50	.....	13.50	19.00
From Birmingham, del. to:				
Boston	19.62	.....	19.50	.....
Newark, N. J.	20.58	.....	.....	.....
Brooklyn, N. Y.	21.39	.....	.....	.....
Baltimore	20.02	.....	19.90	.....
Philadelphia	19.88	.....	19.76	.....
Cleveland	18.62	.....	18.50	.....
Cincinnati	19.13	.....	18.51	.....
Chicago	*18.72	.....	18.60	.....
St. Louis	18.62	.....	18.50	.....

†Southern delivery only. Prices at northern points are adjusted to quotations on northern iron. *Over 0.70 phos.

Basing Point:
Provo, Utah 16.50

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.00. Basing Point: †Johnson City, Tenn.—$23.00. †Off grade material is $19.

Philadelphia, standard and copper bearing 24.13

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	20.50
Pitts. dist. fur.	17.75	Do., del. Chicago	23.54

SILVERY

Jackson County, O., base; 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base; $10%—$27.25; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Iron Ore □ □

Mesabi nonbess.	4.50
High phosphorus	4.40

LAKE SUPERIOR ORE
Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbess.	4.65

EASTERN LOCAL ORES
Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE
Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$16.00-16.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00

Manganese Ore □

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	24.00
So. African, 52%	24.00
So. Afr., 49-51%	22.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories □ □

Per 1000 f.o.b. Works

FIRE CLAY BRICK
First Quality

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00
Ohio	40.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00
Ohio	25.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

BASIC BRICK
Net ton, f.o.b. Baltimore, Plymouth, Meeting, Pa., Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5 □ □

Washed gravel, duty paid, tide, net ton	$19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$17.00

Ferroalloys □ □

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
del. Pittsburgh	90.24
Spiegeleisen, 19-20%, dom. fur. spot†	26.00
Ferrosilicon 50%, freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent. Spot, $5 a ton higher.	126-130.00
Silicomang., 2½ carb.	90.00
2% carbon	95.00
1% carbon	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont.	1.16- 1.25
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 8.25c *Conn. copper*

Sheets

*Yellow brass (high)	14.25
*Copper, hot rolled	15.50
*Lead, cut, to jobbers	8.00
Zinc, 100-lb. base	9.00

Tubes and Pipes

*High yellow brass	16.75
*Seamless copper	16.75

Rods

*High yellow brass	12.75
*Copper, hot rolled	12.75

Anodes

*Copper untrimmed	13.25

Wire

*Yellow brass (high)	14.75

Old Metals □ □

Deal, buying prices, cents lb.

No. 1 Composition Red Brass

*New York	4.87½-5.12½
*Chicago	5.00- 5.25
*Cleveland	5.50- 6.00
*St. Louis	5.00- 5.25

Heavy Copper and Wire

*New York	6.50- 6.62½
*Chicago, No. 1	6.25- 6.50
*Cleveland	6.25- 6.75
*St. Louis	6.00- 6.25

Composition Brass Borings

*New York	4.62½-4.87½

Light Copper

*New York	5.62½-5.87½
*Chicago	5.00- 5.25
*Cleveland	5.50- 6.00
*St. Louis	5.00- 5.25

Light Brass

*Chicago	3.00- 3.25
Cleveland	3.25- 3.50

Lead

*New York	3.12½-3.37½
*Cleveland	3.25- 3.50
*Chicago	3.00- 3.25
*St. Louis	3.20- 3.35

Zinc

New York	2.25- 2.50
*Cleveland	2.25- 2.75
Chicago	2.25- 2.50
St. Louis	2.75-3.00

Aluminum

Clips, soft, Cleve.	13.00-14.50
Borings, Cleveland.	7.00- 7.50
Mixed, cast, Cleve.	11.00-11.25
Mixed, cast, St. L.	11.00-11.25

Secondary Metals □

*Brass ingot, 85-5-5-5	8.75
Remelt al. No. 12	15.50-16.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	10.50-11.50
Boston, dealers	7.50- 7.75
Buffalo, No. 1	12.50-13.00
Buffalo, No. 2	11.00-11.50
Chicago	11.50-12.00
Cleveland, No. 1	12.00-12.50
Cleveland, No. 2	11.50-12.00
Detroit, No. 1	9.75-10.25
Detroit, No. 2	8.75- 9.25
Eastern Pa.	11.50
Eastern Pa., No. 2..	9.50
Federal, Ill.	8.75- 9.25
Granite City, R. R.	8.75- 9.25
Granite City, No. 2	7.75- 8.25
N. Y., deal. R. R.	9.50
N. Y., deal. No. 2	8.00
Pittsburgh, No. 1	14.00-14.50
Valleys, No. 1	14.50-15.00

COMPRESSED SHEETS

Buffalo, dealers	11.00-11.50
Chicago, factory	10.50-11.00
Cleveland	11.00-11.50
Detroit	9.75-10.25
E. Pa., new mat.	10.50-11.00
Pittsburgh	14.00-14.50
St. Louis	8.00- 8.50
Valleys	14.00-14.50

BUNDLED SHEETS

Buffalo	7.50- 8.00
Cincinnati, del.	8.00- 8.50
Cleveland	8.50- 9.00
Pittsburgh	12.50-13.00
St. Louis	6.00- 6.50

SHEET CLIPPINGS LOOSE

Chicago	6.50- 7.00
Cincinnati	7.50- 8.00
Detroit	6.50- 7.00
St. Louis	5.75- 6.25

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Boston, dealers	7.50- 7.75
Buffalo	14.00-14.50
Chicago (3 ft.)	12.50-13.00
Chicago (2 ft.)	13.00-13.50
Cincinnati, del.	13.00-13.50
Detroit	11.50-12.00
Pitts., (open-hearth 3 ft. and less	15.75-16.25
St. Louis, 2 ft. & less	12.50-13.00

STOVE PLATE

Birmingham	7.00- 7.50
Boston, dealers	4.75- 5.00
Buffalo	10.75-11.00
Chicago, net	7.75- 8.25
Cincinnati, dealers..	7.00- 7.50
Detroit, net	7.50- 8.00
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	6.00
St. Louis	6.75- 7.25

COUPLERS, SPRINGS

Buffalo	13.75-14.25
Chicago, springs	12.50-13.00
Eastern Pa.	15.50
Pittsburgh	16.00-16.50
St. Louis	9.00- 9.50

ANGLE BARS—STEEL

Chicago	12.50-13.00
St. Louis	9.50-10.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	14.00-14.50
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa. crops..	14.00-14.50
Pittsburgh, billet, bloom crops	17.00-17.50
Pittsburgh, sheet bar crops	16.00-16.50

FROGS, SWITCHES

Chicago	11.50-12.00
St. Louis, cut	9.50-10.00

SHOVELING STEEL

Chicago	11.50-12.00
Federal, Ill.	7.75- 8.25
Granite City, Ill.	8.75- 9.25

RAILROAD WROUGHT

Birmingham	7.00- 8.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	9.50-10.00
Buffalo, No. 2	12.50-13.00
Chicago, No. 1, net..	9.50-10.00
Chicago, No. 2	11.50-12.00
Cincinnati, No. 2	9.50-10.00
Eastern Pa.	12.00-12.50
N. Y., No. 1 deal.	8.50- 9.00
St. Louis, No. 1	6.50- 7.00
St. Louis, No. 2	8.75- 9.25

SPECIFICATION PIPE

Boston	4.50- 4.75
Eastern Pa.	9.50
New York, dealers..	5.25- 5.50

BUSHELING

Buffalo, No. 1	11.00-11.50
Chicago, No. 1	10.50-10.75
Cinci., No. 1 deal.	7.50- 8.00
Cincinnati, No. 2	5.00- 5.50
Cleveland, No. 2	9.00- 9.50
Detroit, No. 1 new..	8.75- 9.25
Valleys, new No. 1..	14.00-14.50

MACHINE TURNINGS

Bimingham	4.50- 5.00
Boston, dealers	4.00- 4.25
Buffalo	6.25- 6.50
Chicago	7.00- 7.50
Cincinnati, dealers..	6.00- 6.50
Cleveland	9.00- 9.50
Detroit	6.50- 7.00
Eastern Pa.	7.50
New York, dealers..	3.25- 3.50
Pittsburgh	10.50-11.00
St. Louis	4.50- 5.00
Valleys	12.00-12.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	7.75- 8.25
Cincinnati, dealers..	6.00- 6.50
Cleveland	9.00- 9.50
Detroit	7.50- 8.00
Eastern Pa.	6.50
New York, dealers..	2.00- 2.50
Pittsburgh	8.50- 9.00

CAST IRON BORINGS

Birmingham, plain..	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	7.50- 8.00
Chicago	7.50- 8.00
Cincinnati, dealers..	6.00- 6.50
Cleveland	9.00- 9.50
Detroit	7.50- 8.00
E. Pa., chemical	12.00-15.00
New York, dealers..	3.00- 3.50
Pittsburgh	8.50- 9.00
St. Louis	4.50- 5.00

PIPE AND FLUES

Cincinnati, dealers..	5.00- 5.50

RAILROAD GRATE BARS

Buffalo	7.00- 7.50
Chicago, net	7.50- 8.00
Cincinnati	6.00- 6.50
Eastern Pa.	9.00
New York, dealers..	5.00- 5.50
St. Louis	6.00- 6.50

FORGE FLASHINGS

Boston, dealers	6.00- 6.50
Buffalo	11.00-11.50
Cleve., over 10 in.	9.25- 9.75
Detroit	8.50- 9.00

FORGE SCRAP

Boston, dealers	5.00- 6.00
Chicago, heavy	12.50-13.00
Eastern Pa.	10.50-11.00

ARCH BARS, TRANSOMS

St. Louis	11.00-11.50

AXLE TURNINGS

Boston, dealers	4.50- 5.00
Buffalo	9.00- 9.50
Chicago, elec. fur.	10.50-11.00
Cleveland	9.50-10.00
Eastern Pa.	11.00
St. Louis	7.50- 8.00

STEEL CAR AXLES

Birmingham	10.00-11.00
Boston, ship, point..	9.00- 9.50
Buffalo	13.00 13.50
Chicago, net	12.00-12.50
Eastern Pa.	14.00
St. Louis	9.50-10.00

SHAFTING

Boston, ship. point..	11.00-11.25
Eastern Pa.	16.25
New York, dealers..	11.50-12.00
St. Louis	13.00-13.50

CAR WHEELS

Birmingham, iron	9.50-10.00
Boston, iron deal.	6.50- 6.75
Buffalo, iron	12.25-12.75
Buffalo, steel	13.75-14.25
Chicago, iron	12.00-12.50
Chicago, rolled steel	12.50-13.00
Cincinnati, iron	10.25-10.50
Eastern Pa., iron	13.50-14.00
Eastern Pa., steel	15.00-15.50
Pittsburgh, iron	13.00-13.50
Pittsburgh, steel	16.00-16.50
St. Louis, iron	9.50-10.00
St. Louis, steel	9.00- 9.50

NO. 1 CAST SCRAP

Birmingham	9.00- 9.50
Boston, No. 2	5.50- 6.00
Boston, tex. con.	10.50-11.00
Buffalo, cupola	11.50-12.00
Buffalo, mach.	12.00-12.50
Chicago, agri. net	8.25- 8.75
Chicago, mach. net	9.00-10.00
Chi., railroad net	9.00- 9.50
Cinci., mach. cup	10.75-11.25
Cleveland, cupola	11.50-12.50
Detroit, net	9.50-10.00
Eastern Pa., cupola	12.50-13.00
Pittsburgh, cupola..	12.75-13.25
San Francisco, del..	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.25- 8.75
St. L., No. 1 mach..	10.00-10.50

HEAVY CAST

Boston, del.	6.75- 7.00
Buffalo, break.	9.00- 9.50
Cleveland, break.	8.50- 9.00
Detroit, break.	8.50- 9.00
Detroit, auto net	11.00-11.50
Eastern Pa.	11.50-12.00
N. Y., No. 1, deal.	8.00- 8.50
N. Y., break. deal.	8.00- 8.50
Pittsburgh	11.75-12.25

MALLEABLE

Boston, consum.	12.50-13.00
Buffalo	13.25-13.75
Chicago, R. R.	12.25-12.75
Cincinnati, agri. del.	9.75-10.25
Cinci., R. R. del.	10.50-11.00
Cleveland, rail.	13.00-13.50
Detroit, auto	9.75-10.25
St. Louis, R. R.	9.50-10.00
Eastern Pa., R. R.	11.50-12.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.50-11.50
Boston, dealers	7.50- 7.75
Buffalo	12.00-12.50
Chicago	12.50-13.00
Eastern Pa.	13.00
New York, dealer.	8.00- 8.50
St. Louis	10.00-10.50

LOCOMOTIVE TIRES

Chicago (cut)	12.50-13.00
St. Louis, No. 1	9.75-10.25

LOW PHOS. PUNCHINGS

Buffalo	13.75-14.25
Chicago	12.50-13.00
Eastern Pa.	14.50-15.00
Pittsburgh	15.50-16.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99% Spot, N. Y.	Antimony Ingot Nickel
April 7	8.25	8.37½	8.00	56.75	56.82½	4.00	3.90	4.35	*22.90	7.95	36.00
April 9	8.37½	8.50	8.12½	56.37½	56.45	4.10	3.95	4.40	*22.90	7.95	36.00
April 10	8.37½	8.62½	8.12½	55.80	55.87½	4.25	4.10	4.40	*22.90	7.95	36.00
April 11	8.50	8.62½	8.25	55.75	55.82½	4.25	4.10	4.40	*22.90	7.95	36.00
April 12	8.50	8.62½	8.25	55.62½	55.67½	4.25	4.10	4.40	*22.90	7.95	36.00
April 13	8.50	8.62½	8.25	55.50	55.55	4.25	4.10	4.40	*22.90	7.95	36.00

*Nominal range 10.00c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.75c
Boston††	2.90c
Buffalo	2.95c
Chattanooga	3.26c
Chicago	2.90c
Cincinnati	3.10c
Cleveland	2.90c
Detroit	2.98½c
Houston	3.00c
Los Angeles	3.40c
New Orleans	3.00c
New York‡(d)	3.17c
Pittsburgh	2.85c
Philadelphia*	2.75c
San Francisco	3.55c
Seattle	3.40c
St. Louis	3.14c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	
Portland	3.40c
Baltimore*	2.60c
Chattanooga	3.26c
Chicago	2.75c
Cincinnati	3.10c
Detroit	2.98½c
New York‡(d)	3.10c
Philadelphia*	2.75c
St. Louis	3.14c
Tulsa	3.25c

REINFORC. BARS	
Boston	2.75c-3.25c
Buffalo	1.95c
Chattanooga	3.26c
Chicago	1.95c-2.10c
Cleveland (c)	1.97½c
Cincinnati	3.10c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.00c
New York	3.17c
Philadelphia	2.62½c
Pitts., plain	3.00c
Pitts., twisted squares	3.12½c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.29c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	
Baltimore*	2.75c
Boston††	3.07c
Buffalo	3.20c
Chattanooga	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.21c
Detroit	3.30c
Houston	3.00c
Los Angeles	3.40c
New Orleans	3.50c
New York(d)	3.27c
Philadelphia*	2.75c
Pittsburgh	3.05c
Portland	3.40c
San Francisco	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

PLATES	
Baltimore*	2.75c
Boston††	3.08c
Buffalo	3.20c
Chattanooga	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland, ¼-in. and thicker	3.21c
Cleve., ⅜-in.	3.20c
Detroit	3.30c
Detroit, ⅜-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New Orleans	3.50c
New York(d)	3.30c
Philadelphia*	2.75c
Phila. floor	4.35c
Pittsburgh	3.05c
Portland	3.40c
San Francisco	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	
Baltimore*	2.95c
Boston††	3.15c
Buffalo	3.10c
Chattanooga	3.26c
Chicago	2.95c
Cincinnati	3.10c
Cleveland	3.01c
Det., 8-10 ga.	3.03½c
Houston	3.35c
Los Angeles	3.65c
New Orleans	3.50c
New York	3.17c
Portland	3.65c
Philadelphia*	2.95c
Pittsburgh	2.85c
San Francisco	3.75c
Seattle	3.65c
St. Louis	3.19c-3.36c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	
Baltimore*†	3.50c
Boston (g)	3.75c
Buffalo	3.25c
Chattanooga	4.01c
Chicago	3.70c
Cincinnati	3.85c
Cleveland	3.76c
Detroit	3.78½c
Los Angeles	4.15c
New York	3.65c
Philadelphia*†	3.40c
Pittsburgh**	3.40c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.94c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	
Baltimore*†	3.75c
Buffalo	4.00c
Boston (g)	4.35c
Chattanooga	4.61c
Chicago	4.20c-4.30c
Cincinnati	4.45c
Cleveland	4.36c
Detroit	4.45c
Houston	4.40c
Los Angeles	4.75c
New Orleans	4.35c
New York	4.25c
Pitts.**	3.90c-4.20c
Portland	4.85c
San Francisco	4.85c
Seattle	4.85c
St. Louis	4.54c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	4.00c

BANDS	
Baltimore	3.05c
Boston††	3.15c
Buffalo	3.30c
Chattanooga	3.51c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Detroit, ⅜-in. and lighter	3.28½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.20c
New York(d)	3.42c
Philadelphia	3.05c
Pittsburgh	3.10c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.44c

HOOPS	
Baltimore	2.80c
Boston	4.15c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.35c
Det., No. 14 and lighter	3.28½c
New York	3.42c
Philadelphia	3.30c
Pittsburgh	3.60c
Seattle	5.40c
St. Paul	3.75c

COLD FIN. STEEL	
Baltimore (c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	5.95c
New Orleans	4.25c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle (f)(d)	4.75c
St. Paul	3.20c
St. Louis	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	
Boston, 0.100-in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleveland (b)	5.55c
Detroit	5.40c
Philadelphia	4.00c
New York	4.55c
St. Louis	5.74c

(b) Net base, straightening, cutting, boxing, 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, April 12

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

PIG IRON	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	£ s d
Foundry, 2.50-3.00 Silicon.	$15.12	2 18 6	$8.03	1 13 0
Basic bessemer	13.96	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	16.29	3 3 0	....	.....
SEMIFINISHED STEEL				
Billets	$28.44	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage	40.33	7 16 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$40.07	7 15 0	$26.77	5 10 0
Merchant bars	1.73c	7 10 0	.69c to .72c	3 2 6 to 3 5 0
Structural shapes	1.70c	7 7 6	.63c to .66c	2 17 6 to 3 0 0
Plates, †¼ in. or 5 mm.	1.85c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.14c	9 5 0	1.27c to 1.29c	5 15 0 to 5 17 6
Sheets, gal., 24 gage, corr.	2.60c	11 5 0	1.51c	6 17 6
Bands and strips	1.91c	8 5 0	.88c	4 0 0
Plain wire, base	2.25c	9 15 0	1.18c	5 7 6
Galvanized wire, base	2.66c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.77c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 4.27	0 16 6	....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4($3.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$17.45	3 7 6(a)	$12.56	190	$13.84	295	$24.94	63
Basic bessemer pig iron	16.80	3 5 0(a)*	12.23	185	13.37	285	27.52	(b)69.50
Furnace coke	4.52	0 17 6	7.93	120	5.16	110	7.61	19.25
Billets	28.44	5 10 0	28.42	430	20.64	440	38.20	96.50
Standard rails	1.91c	8 5 0	2.10c	700	2.31c	1,100	2.38c	132
Merchant bars	1.99c	8 12 0	1.68c	560	1.16c	550	1.98c	110
Structural shapes	2.02c	8 15 0	1.65c	550	1.16c	550	1.94c	107.50
Plates, †¼-in. or 5 mm.	2.05c	8 17 6	2.10c	700	1.47c	700	2.29c	127
Sheets, black	2.37c	10 5 0§	2.55c	850‡	1.63c	775‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.95c	12 15 0	4.50c	1,500	3.15c	1,500	6.66c	370
Plain wire	2.25c	9 15 0	3.39c	1,130	2.31c	1,100	3.11c	173
Bands and strips	2.43c	10 10 0	1.95c	650	1.47c	700	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite

Bars

Bar Prices, Page 58

Pittsburgh—An advance of $2 a ton in alloy steel bars has been filed, making the market now based on 2.55c, Pittsburgh. It is expected that all bases on alloy bars will be placed on the same 2.55c base, thus doing away with the former $2 spread at the Bethlehem, Pa., base. No change has been signified in the usual alloy differentials for S.A.E. analyses. Carbon steel bars are now quoted 1.90c, Pittsburgh.

Cleveland—Contracts and specifications are exceptionally heavy, little time lapsing between commitments for second quarter and releases for April shipment. The advance of $3 a ton which will be in effect this week brought out a good volume of miscellaneous business.

Chicago—Steel bar contracting has been heavy and most important consumers will have obtained protection on second quarter requirements before new prices take effect. The $3 a ton advance to 1.95c, Chicago, generally becomes effective April 17. An advance in the price of bar iron, recently 1.60c, Terre Haute, Ind., is expected to be announced. Specifications are well maintained and consumption by leading users holds around the rate of the preceding several weeks.

Boston — Commercial steel bar specifications are slightly heavier with most regular consumers covered before the price advance. Contracting in soft steel bars also mildly stimulated demand for forging and alloy bars with spot shipments heavier. On new business 2.30c, Boston, will apply.

New York—Steel bars are less active with the new price 2.23c, delivered, New York.

Philadelphia — With $3 advance now effective on commercial steel bars, with Pittsburgh at 1.90c and the delivered price locally, 2.19c, most contract customers have been covered for this quarter and general activity, as a result, has slowed materially.

Plates

Plate Prices, Page 58

Pittsburgh — McClintic-Marshall Corp., Bethlehem, Pa., bid low at $51,000 last week to the Memphis, Tenn., engineers for a steel hull, requiring 44 tons of plates. The government estimate was $66,680 and second low bidder was Midland Barge Co., Midland, Pa., at $62,000. Other bidders were Chicago Bridge & Iron Works, $69,770, and Dravo Contracting Co., $70,875. About 1730 tons in the Forest county bridge, Pennsylvania, which went in for bids April 13, was in plates. Bids went in April 12 to Vicksburg, Miss., engineers for 200 tons in two steel oil barges. Inquiry for tanks is especially slow but tank builders have been prominent among those requesting plate coverage last week at 1.70c, Pittsburgh, before the advance to 1.85c, Pittsburgh, became effective.

Cleveland—Contracting for plates for second quarter has been moderate in this district. Demand for plates, like that for shapes, has been quiet. Little tank work is being figured here. Brewing interests have not been able to finance the purchase of all the tanks they evidently require, and there have been one or two instances recently of manufacturers having to take back tanks made for breweries. Oil companies, under their code, can no longer give station tanks to distributors and this has resulted in the loss of some tank business.

Chicago—The new 1.90c, Chicago, market on plates, an increase of $3 a ton, becomes effective here April 17. Fairly heavy coverage has been effected at the old price. Demand is slightly more active, with railroads increasing orders for repair materials. Tank work is headed by 1300 tons for five oil storage tanks at East Chicago, Ind. McClintic-Marshall Corp. is low on 10,000 tons for a pipe line at the Stacy park reservoir, St. Louis.

Boston—Plates are slightly more active. Boiler shops are busier and small tank and railroad needs have gained. Plates on new business after this week will be 2.25c, delivered Boston.

New York—Plate contracting is subsiding with protections out on a large number of identified jobs, most of which are under 100 tons each. Silas Mason, New York, and Walsh Construction Co. Syracuse, N. Y., are low jointly on 8000 tons of plates and shapes, principally plates, for a diversion tunnel at Fort Peck, Mont.

Philadelphia—Most contract buyers of plates are now covered for the current quarter, buying being less since the $3 advance to 1.95c, Coatesville, Pa., became effective. Spot specifications have expanded, but producers look for an increasing volume of releases as the quarter progresses, with a heavy volume in June.

Contracts Placed

4500 tons, plates, shapes and bars, estimated second quarter requirements, Norfolk & Western to Carnegie Steel Co., Pittsburgh; Central Iron & Steel Co., Harrisburg, and Lukens Steel Co., Coatesville, Pa.

190 tons, 1,000,000-gallon standpipe, Jamaica Water Supply Co., Jamaica, N. Y., to Chicago Bridge & Iron Works, Chicago.

110 tons, 250,000-gallon elevated tank, Gretna, La., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

110 tons, welded steel tank barge, United Dry Docks Inc., New York, to Lukens Steel Co., Coatesville, Pa.

Unstated tonnage, mainly 21 and 28-inch land pipe, 960 pieces 12 feet 10 inches long, fabricated of ¼ and ½-inch plate for Kansas City engineers, shipment to Fort Peck, Mont., to McClintic-Marshall Corp.

Contracts Pending

10,000 tons, pipe line, Stacy park reservoir, St. Louis; McClintic-Marshall Corp., Bethlehem, Pa., low.

8000 tons, plates and shapes, mostly plates, for diversion tunnel, Fort Peck, Mont.; Silas Mason, New York, Walsh Construction Co., Syracuse, N. Y., jointly low.

1300 tons, five oil storage tanks, East Chicago, Ind., Wadhams Oil Co., Milwaukee.

1000 tons, estimated, gas holder, Holyoke, Mass., bids April 17.

700 tons, for United States engineers' office, Memphis, Tenn., St. Louis Car Co., St. Louis, low.

440 tons, steel hull for United States dredge OMEGA, Memphis, Tenn., engineers' office, hull to be 172 x 44 x 8 feet. McClintic-Marshall Corp., low at $51,000; Midland Barge Co., second low at $62,000; government estimate $66,680.

300 tons, tank, Lake Charles, La.

150 tons, elevated tank, Upper Arlington, O.

125 tons, buoy bodies, lighthouse bureau, Staten Island, N. Y., bids May 3.

100 tons, elevated tank, Grandview Heights, O.

Sheets

Sheet Prices, Page 58

Pittsburgh—The $5 to $8 per ton increase in all grades of sheets is now in effect. A wide advance will likely be made this week on electrical sheets, where the market has not changed since the $10 per ton reduction two years ago. Revised prices now quoted at Pittsburgh follow: Black sheets, 2.65c; galvanized, 3.25c; No. 10 hot-rolled, 2.00c; and No. 20 gage cold-rolled, 3.15c.

Cleveland—Some sheet producers stopped taking contracts for second quarter last week several days before price advances went in effect, explaining their entire output for the period had been covered. It is believed auto-

mobile manufacturers and other large consumers will endeavor to stock material for July, but there are difficulties in going beyond that month, not the least of which would be the high carrying charges. Specifications for April shipment have been issued by a large list of diversified consumers, and more specifications for May delivery have been received from leading automobile interests. Sheet mill schedules here and in adjacent lake district are close to capacity.

Chicago—The sharp advance in sheet prices has been followed by fairly complete coverage of at least second quarter by most large buyers. Speculative buying has been done in some instances, although it is difficult to estimate actual needs of some users beyond June. Shipments the past week tended downward slightly and in instances consumers are expected to defer receipt of material contracted for until later in the quarter. Automotive requirements still are heavy but no additional betterment is noted in shipments. While operations of farm implement manufacturers have shown some improvement, sheet specifications from this group still are light.

Boston—Some business against sheet contracts placed before the recent price advance is being specified, although the volume is not materially heavier. Industrial consumers and jobbers are the most active.

New York—Sheet contracting has dropped sharply, with the new prices now in effect.

Philadelphia—Activity in sheets, so noticeable since the first of the month, now is tapering off rapidly with price advances by most sellers now in effect. On some grades producers are virtually booked up for the remainder of the quarter. Recent contracting has included substantial tonnages for stovemakers, autobody manufacturers and radio manufacturers.

Under the new price schedules No. 10 hot-rolled sheets, delivered Philadelphia, now are 2.29c; No. 24 hot-rolled annealed 2.94c; and galvanized 3.64c. No. 10 cold-rolled are 2.84c, and No. 20, 3.44c.

Buffalo—Buffalo sheet mills continue to operate at 80 to 90 per cent and have sufficient orders on hand to maintain this rate throughout the month.

St. Louis—Producers and distributors of steel sheets report further general improvement in business. Contracting for second quarter has exceeded expectations.

Cincinnati—Contracting for second quarter sheet requirements continued active, bookings for some classes of material approaching mill capacity. Labor difficulties at the Newport, Ky., rolling mill were settled after a strike of several hundred men for one week.

Railroads

Track Material Prices, Page 59

Rail buying continues at a heavy rate, the past week seeing 58,000 tons placed. Baltimore & Ohio has distributed 35,000 tons, 15,000 tons going to Carnegie Steel Co., 10,000 tons to Bethlehem Steel Co., 7000 tons to Illinois Steel Co., and 3000 tons to Inland Steel Co. Track accessories totaling 15,000 tons is reported divided among several producers. Great Northern has allotted 20,000 tons, the Clinchfield 2000 tons and Pere Marquette 1000 tons.

New York, New Haven & Hartford is expected to inquire shortly for 25,000 tons of rails and 10,000 tons of accessories.

Delaware, Lackawanna & Western closed last week on 500 steel hopper cars, dividing the order between American Car & Foundry Co., which took 350 cars and Magor Car Corp., New York, 150 cars. At the same time the road bought 20 steam locomotives from American Locomotive Co., and four oil-electric locomotives, two each from General Electric Co., Schenectady, N. Y., and Ingersoll-Rand Co., New York.

Equipment inquiries include 500 steel box cars for the Chicago Great Western and 75 passenger and baggage-express cars for the Chicago, Milwaukee, St. Paul & Pacific.

Great Northern will start soon on a comprehensive program of equipment repair, having received a PWA loan for this purpose.

In view of what may be a wide increase in track fastening prices, inquiries of this nature were numerous last week and among them was the Chesapeake & Ohio inquiry for approximately 1,000,000 tie plates and a Nickel Plate inquiry for about 185,000 tie plates. Pere Marquette has divided 600 tons of fastenings between Jones & Laughlin Steel Corp., Republic Steel Corp., Illinois Steel Co. and an unstated manufacturer.

Orders are expected to be distributed shortly for about 6000 tons of plates, shapes and bars, 1500 tons of wheels and 825 tons of axles by American Car & Foundry Co. and Magor Car Corp., for cars they are to build for the Delaware, Lackawanna & Western. New York Central has distributed 10,500 tons of miscellaneous steel.

No decision has been made on the price of standard steel rails following April 15. Light rails are advanced $3 a ton to $35, mill, for billet quality, and $34 for rerolling grades.

Car Orders Placed

Chilean State Railways, 15 coaches, to Bethlehem Steel Co., Bethlehem, Pa.

Delaware, Lackawanna & Western, 350 steel hoppers, to American Car & Foundry Co., New York, and 150 steel hoppers to Magor Car Corp., New York.

Erie, fifty 50-ton bulk cement cars, to Greenville Steel Car Co., Greenville, Pa.

Locomotives Placed

Delaware, Lackawanna & Western, 20 steam locomotives, to American Locomotive Co., New York.

Delaware, Lackawanna & Western, four oil-electric locomotives, two each to General Electric Co., Schenectady, N. Y., and Ingersoll-Rand Co., New York.

Rail Orders Placed

Baltimore & Ohio, 35,000 tons, divided as follows: Carnegie Steel Co., 15,000 tons, Bethlehem Steel Co., 10,000 tons, Illinois Steel Co., 7000 tons, Inland Steel Co., 3000 tons. About 15,000 tons accessories also distributed.

Clinchfield, 2000 tons, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Great Northern, 20,000 tons, 110-pound rails; 10,000 tons to Illinois Steel Co., Chicago; 5000 tons to Inland Steel Co., Chicago, 5000 tons to Bethlehem Steel Co., Bethlehem, Pa. Unstated tonnage of fastenings to various producers.

Pere Marquette, 1000 tons rails, to Inland Steel Co., Chicago.

United States engineer, Chicago, 165 tons, 60-pound relaying rails, to Hyman-Michaels Co., Chicago.

Car Orders Pending

Director of purchases, Tennessee valley authority, Knoxville, Tenn., two steel dump cars for transfer of concrete, Norris Dam; bids April 23.

Locomotives Pending

Chief engineers, army, Washington, eight-ton gasoline mechanical driven locomotive; bids April 16.

Director purchases, Tennessee valley authority, Knoxville, Tenn., four 8-ton standard gage gasoline locomotives for use on Norris dam; bids April 23.

Strip Steel

Strip Prices, Page 59

Pittsburgh — For some makers the advances in hot and cold-rolled strip steel became effective the middle of last week but uniformly dating with April 16 the market on hot-rolled strip steel is quoted 2.00c

base, Pittsburgh, for hot-rolled and 2.80c base, Pittsburgh or Cleveland, for cold-rolled. Even at these levels, the smaller nonintegrated strip producers claim that with the advance in billets, plus their 10 per cent labor increase, plus fuel and other cost advances, that they are unable to return a profit.

Cleveland — Consumers covered second quarter requirements in advance of the increase of $5 a ton on hot strip and $8 on cold strip, now in effect for second quarter. While no material placed at the low prices is expected to lapse for lack of specifications some mills could take on additional tonnage for April rolling.

Chicago—Second quarter contracting has been heavy and effective dates of price advances announced recently are expected to find important consumers protected at old levels. New prices are 2.10c, Chicago, for hot strip and 2.80c, Pittsburgh-Cleveland, for cold-rolled strip. Shipments are heavy, particularly on cold-rolled material on which three to four weeks delivery is asked on certain grades.

Boston—Cold strip buying is more active, notably for manufacturing needs. Hot strip is also moving better to rerollers. With the recent sharp advance in cold strip sellers will quote 3.00c, Worcester, but consumers have generally covered for the remainder of the quarter at 2.60c with indications that business at 3.00c will be light until after June 30.

Philadelphia—Most strip consumers are now covered for the current quarter, with the advances of $5 on hot-rolled and $8 on cold-rolled strip now generally effective. The new prices are 2.29c, delivered, Philadelphia, on hot-rolled and 3.09c, on cold-rolled.

Tin Plate

Tin Plate Prices, Page 58

Pittsburgh—The advance of $8 a ton in No. 24 long ternes, 8-pound coating, has become effective placing the market at 3.65c, Pittsburgh. A $7 a ton increase has been made in stock tin plate, with this now quoted 4.90c. No change has been made in the price of standard tin plate which holds at $5.25 per base box. Featured by strong domestic demand plus a steady rate of ordering from foreign sources, the tin plate market is able to sustain an 80 per cent operating rate. Among recent orders are those from packers in South America, Japan and Scandinavia. With a $4 a ton advance, tin mill black sheets now are quoted 2.85c base, Pittsburgh.

Cold Finished

Cold Finished Prices, Page 59

Pittsburgh — An advance of $2 a ton in cold-finished alloy steel bars is expected to be announced shortly, following a similar advance in hot-rolled alloy bars. Since cold-drawn bars have been taking a 50-cent differential over the hot-rolled base, if this spread is maintained the new cold-drawn base will be 3.05c, Pittsburgh. No change has been made in the cold-drawn carbon steel bar price of 2.10c, Pittsburgh, and turned and ground shafting prices at Pittsburgh hold unchanged.

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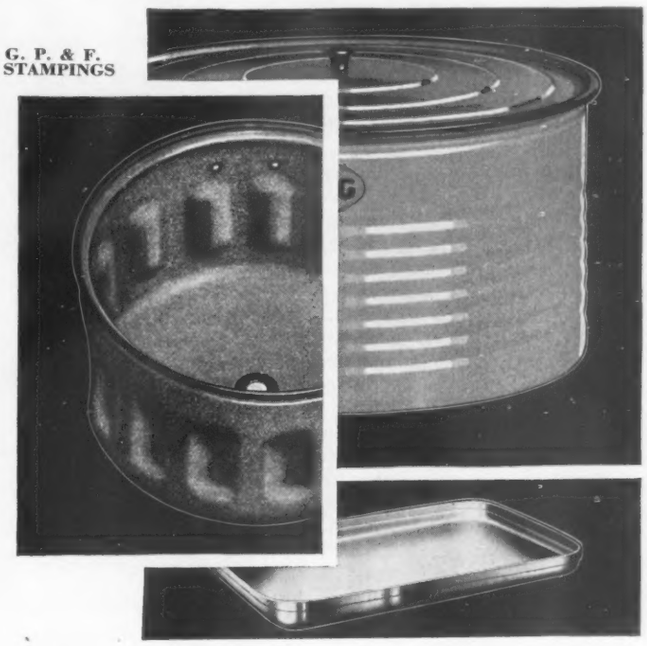

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Shapes

Structural Shape Prices, Page 58

Pittsburgh—Although structural shapes are now 1.85c base Pittsburgh protections have been widespread at the old basis of 1.70c base, Pittsburgh. Steel sheet piling is now quoted 2.15c base, Pittsburgh, on all projects not protected at the former 2.00c, Pittsburgh, price. Last week, inquiries were fewer but included a 1200-ton New York school building at Newark, N. Y. Independent Bridge Co., Pittsburgh, has begun fabricating about 3000 tons of structural steel for the Montgomery island dam's service bridge.

Cleveland—Structural shape producers' offer to protect fabricators for 60 days on specific jobs at the former price of 1.70c, base, Pittsburgh, for plain material is understood to have brought out heavy requirements in some districts. Many prospective builders made sure of their protections. Except for these specific jobs fabricated prices will immediately begin to reflect the $3 a ton advance in plain material. Nickel Plate railroad is taking bids April 25 on 300 tons for a bridge at Willoughby, and Ford Motor Co. is reported in the market for 450 tons for a gas cleaning plant at Detroit.

Chicago — Structural shape awards continue light but pending tonnages are heavier, the largest of new projects being 5000 tons for a Louisiana chemical plant. Additional Illinois highway bridges are up for bids with awards scheduled soon on state bridges on which bids have been closed. Other inquiries also are made up principally of bridge work.

Boston—Bids close May 9 with the United States engineer, Boston, on the superstructure, railroad lift bridge, Cape Cod canal, Massachusetts, taking close to 5000 tons of structurals, the largest pending project in New England. A substantial volume of business is being figured including a highway structure at Medford, Mass. Structural fabricators are not buying beyond definite requirements.

New York—Structural steel requirements have dropped to a low point for this district. A few small projects are up, but little substantial volume. Some of the smaller structural shops, however, are doing fair on miscellaneous projects taking 50 tons or less.

Philadelphia—Structural activity is featured by the reported award of 4300 tons for a section of the Camden, N. J., approach to the high-speed line bridge over the Delaware river at Philadelphia.

The increase of $3 a ton on shapes to 1.95c, Bethlehem, Pa., will become effective this week.

Buffalo—Demand for small lots of structural steel is good. Fabricators are adding to their working forces.

Birmingham, Ala. — Structural steel fabricating shops are operating four days a week.

Contracts Placed

4500 tons, auditorium, Kansas City, Mo.; 2500 tons to Kansas City Structural Steel Co., Kansas City, Mo.; 1000 tons to American Bridge Co., Pittsburgh; 1000 tons to McClintic-Marshall Corp., Bethlehem, Pa. Previously reported all to Kansas City Structural Steel Co.

4300 tons, section 2, Camden approach Delaware river bridge, Philadelphia, reported placed, through Marcus Construction Co., New York, with United States Steel Corp. subsidiaries; this includes 2500 tons of shapes and 1800 tons of piling; 1100 tons of reinforcing bars also placed.

1300 tons, superstructure, Pee Dee and Waccamau river bridges, Georgetown, S. C., to Nashville Bridge Co., Nashville, Tenn.

987 tons, bridge, Ocklockonee Bay, Fla., to McClintic-Marshall Corp., Bethlehem, Pa.; George D. Auchter, Jacksonville, general contractor.

760 tons, Campostella bridge, bascule span, Norfolk, Va., to Virginia Bridge & Iron Co., Roanoke, Va.

670 tons, building, Sheffield Farms, Bronx, New York, to F. G. Schaeffer Iron Works, Edgewater, N. J.; through William Kennedy Construction Co.

635 tons, state highway bridges, Rapidam river and Bremo, Virginia, to Virginia Bridge & Iron Co., Roanoke, Va.

580 tons, piling, dock, East Chicago, Ind., for Wadham Oil Co. to Inland Steel Co., Chicago.

465 tons, locks and shields, Hudson river midtown tunnel to Alco Products Co., Dunkirk, N. Y.; Mason & Hangar Co., New York, general contractor.

370 tons, warehouse, Fort Sam Houston, Tex., to Houston Structural Steel Co., Houston, Tex.

370 tons, sports building, University of Minnesota, Minneapolis, to Crown Iron Works, Minneapolis.

370 tons, warehouse, crane house and other buildings, Aberdeen proving grounds, Maryland, to Dietrich Bros., Baltimore; Seymour Ruff & Son, general contractor.

300 tons, alterations to office building, 1520 Chestnut street, Philadelphia, to Morris, Wheeler & Co., Philadelphia.

300 tons, bridge, Walsenburg, Colo., to Minneapolis-Moline Power Implement Co., Minneapolis.

300 tons, two state bridges, King and Lewis counties, Washington, to Wallace Bridge & Structural Co., Seattle; West Coast Construction Co., Seattle, general contractor.

290 tons, county home, Schenectady, N. Y., to Frank & Fordyce, Schenectady.

275 tons, station, Pennsylvania-Reading Seaboard railroad, Atlantic City, to McClintic-Marshall Corp., Bethlehem, Pa.

255 tons, bridge, La Crescent, Minn., to American Bridge Co., Pittsburgh.

240 tons, state highway bridge, Harmon, N. Y., to Leider Structural Steel Co., New York.

230 tons, school 37, Buffalo, to McClintic-Marshall Corp., Bethlehem, Pa.

227 tons, underpass, highway 5, near Wichita Falls, Tex., to American Bridge Co., Pittsburgh; C. S. Constant Co., Dallas, general contractor. Texas Steel Co. awarded 20 tons of reinforcing bars.

212 tons, underpass and viaduct, Waco and Fort Worth, Tex., to Central Texas Iron Works, Waco, Tex.; Butcher & Sweeney, Fort Worth, general contractors.

200 tons, state undercrossing, Spokane county, Washington; to unnamed eastern interest; Andrew Sather, Seattle, general contractor.

200 tons, power house, state school, Rome, N. Y., to Syracuse Engineering Co., Syracuse, N. Y.; W. J. Burns Co., Syracuse, general contractor. Milton Mfg. Co., Milton, Pa., awarded 33 tons of reinforcing bars.

190 tons, state highway bridge, Salina, Kans., to Capital Iron Works Co., Topeka, Kans.

175 tons, warehouse annex, Cedar Rapids, Iowa, to Iowa Steel & Iron Co., Stone & Webster Engineering Co., engineers.

170 tons, material for reinforcing a bridge at Williamsport, Md., to American Bridge Co., Pittsburgh; through Farris Engineering Co.

170 tons, bridge, Williamson county, Texas, to Kansas City Structural Steel Co., Kansas City, Mo.

150 tons, bridge, Glenarm, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, bridges and repairs, Southern Pacific railroad, Montana, to Minneapolis-Moline Power Implement Co., Minneapolis.

150 tons, bridge, Hominy, Okla., to Capitol Steel & Iron Co., Oklahoma City.

150 tons, laboratory building, Niagara Falls, N. Y., for Union Carbide & Carbon Co., to McClintic-Marshall Corp., Bethlehem, Pa.

145 tons, shapes and bars, recreational building, veterans' hospital, St. Petersburg, Fla., to Ingalls Iron Works Co., and Connors Steel Co., Birmingham; Edward F. Moore & Sons, Kokomo, Ind., general contractors.

140 tons, addition to Heinz Co. plant at Medina, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

140 tons, grain elevator, Tonawanda, N. Y., to McClintic-Marshall Corp.; through McDonald Engineering Co.

130 tons, state highway bridge, Pueblo,

Shape Awards Compared

	Tons
Week ended April 14	**16,827**
Week ended April 7	**6,021**
Week ended March 31	**11,138**
This week in 1933	**5,215**
Weekly average for 1933	**15,413**
Weekly average 1934	**16,609**
Weekly average, March	**18,349**
Total to date 1933	**158,671**
Total to date 1934	**265,742**

Colo., to American Bridge Co., Pittsburgh.

130 tons, warehouse, Container Corp. of America, Philadelphia, to Frank M. Weaver & Co., Lansdale, Pa.

125 tons, bridge, Pueblo, Colo., to American Bridge Co., Pittsburgh.

120 tons, state highway bridge, Ragan, Wyo., to American Bridge Co., Pittsburgh.

119 tons, steel piling, quartermaster, port of embarkation, Brooklyn, N. Y., to Carnegie Steel Co., Pittsburgh. Carroll-McCreary awarded bars, and Bayonne Bolt Co. tie rods and washers.

109 tons, bridges and underpass, highway 49, Lamar county, Texas, to Austin Bros., Dallas, and Virginia Bridge & Iron Co., Roanoke, Va.; George W. Condon & Co., Dallas, general contractor. Southern States Steel Co. awarded 76 tons of reinforcing bars.

100 tons, trestle, Gowanda, N. Y., state hospital, to McClintic-Marshall Corp., Bethlehem, Pa.

100 tons, state bridges, Hutchinson and Matagorda counties, Texas, to Austin Bros., Dallas; Austin Bridge Co., Dallas, general contractors. For bridge, Galveston county, 161 tons to be placed by same contractor.

100 tons, shapes and bars, bottling plant, Rochester Brewing Co., Rochester, N. Y. to Genesee Bridge Co., Rochester; Stewart & Bennett Inc., Rochester, general contractor.

100 tons, sewage disposal plant, Perth Amboy, N. J., to Elizabeth Iron Works, Elizabeth, N. J.

Contracts Pending

12,000 tons for power house, Boulder dam, Boulder City, Nev.; bids opened April 5 by United States bureau of reclamation.

5000 tons, chemical plant, Baton Rouge, La., for Solvay Process Corp.

5000 tons, superstructure, railway lift bridge, Cape Cod canal, Massachusetts; bids May 9 to United States engineer, Boston.

3000 tons, air depot, Middletown, Pa., new bids to be asked; Rust Engineering Co., Pittsburgh, was low on general contract at original opening.

3000 tons, vertical lift bridge, Buzzards Bay, Mass., over New York, New Haven & Hartford railroad tracks; bids to government.

2035 tons, M street bridge, Sacramento, Calif., for state; bids in April.

1400 tons, bridge, Spring Valley, Ill.; McClintic-Marshall Corp., low.

1200 tons, school, Newark, N. Y.

1200 tons, hangars, Colombia, South America; bids asked.

1200 tons, Newark, N. Y., school; bids April 20.

915 tons, state highway bridge, Medford, Mass.

900 tons, Illinois highway bridges; bids April 18.

614 tons, undercrossing Pocatello, Idaho; bids April 13.

600 tons, tunnel structures, metropolitan water district, Los Angeles; bids April 23.

600 tons, building, Howard university, Washington; Agostini Bros., New York, low.

375 tons, bridges, Oklahoma City, Okla.

325 tons, state bridge, Buchanon, Va., pending.

300 tons, federal warehouse extension, Washington, Walter Kidde Construction Co., New York, low on general contract; approximately 2000 tons of rail steel reinforcing bars also required.

220 tons, industrial arts school, Jamestown, N. Y.; bids in.

200 tons, one plate bridge and one I-beam overhead span, Jefferson township, West Elizabeth borough, Allegheny county, Pennsylvania; Mike Mannella, Pittsburgh, low at $311,059, bids of April 6; included 61 tons of plain steel bars.

200 tons, University of Washington library addition; bids at Seattle, April 17.

190 tons, intracoastal canal bridge, Galveston county, Texas.

150 tons, Alsea state bridge, Oregon; Lindstrom & Feigenson and Parker & Banfield, Portland, low.

150 tons, school, Ausable Forks, N. Y.; bids April 17.

135 tons, bridge, Louisiana highway commission; bids May 1.

150 tons, manufacturing building, Trenton, N. J.; bids asked.

110 tons, Pennsylvania railroad bridge, Granville, Pa., pending.

100 tons, plant addition, E. I. du Pont de Nemours Inc., Carney's Point, Pa.

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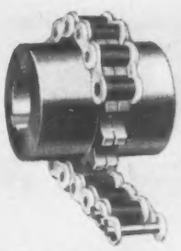

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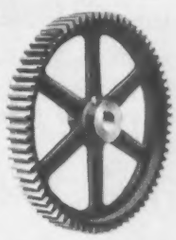

Gears—spur, bevel, miter, worm, herringbone

Pulleys—Solid or Split

Reinforcing

Reinforcing Bar Prices, Page 59

Pittsburgh—An advance in new billet steel bars for reinforcing purposes is expected to be confirmed momentarily, but in the meantime the market continues 1.90c, Pittsburgh, on cut lengths. Truscon Steel Co., Youngstown, O., has booked an order for 218 tons for work in Luzerne county, Pennsylvania, through W. Grant Raub, Red Lion, Pa. Results of bidding on a Pennsylvania letting of April 6 finds several Pittsburgh contractors low on small tonnages.

Cleveland—Though new concrete bar prices have not been filed by producers in this district, an increase of at least $3 a ton in line with the rise of $3 in merchant steel bars is expected shortly. Sellers have been endeavoring to close certain pending projects before the anticipated adjustment. This tonnage, however, is not large and the market still lacks improvement.

Chicago—Few bar inquiries for private construction are appearing here, most of recent activity coming from highway work and other public projects. Awards for Chicago sanitary district construction include 600 tons for one project, with additional bids to be asked for this work in the near future. Road building in Illinois and neighboring states involves a fairly large tonnage, with bids to be asked later on additional tonnages. Advances in reinforcing bar prices have yet to be filed, although these are anticipated soon. The market currently is 1.95c for cut lengths of billet bars and 1.80c for rail steel.

Boston—Bids are in on several hundred tons for Massachusetts state highways, and a bridge at Lexington. Connecticut bridges, taking 350 tons, have been placed and inquiry is holding up well.

New York—Except for close to 500 tons placed for New Jersey highway projects, concrete reinforcing steel buying is light. Inquiry also is sluggish. Higher prices on reinforcing material are expected to be announced shortly.

Philadelphia — Reinforcing bar sellers here look for a $3 increase in prices shortly, to 2.34c, delivered, Philadelphia, on billet bars, cut lengths. Award of 1100 tons for the first section of the Camden approach to the high-speed line over the Delaware river is reported, with the structural shapes.

Reports here indicate a New York contractor has been awarded the general contract for the federal warehouse extension in Washington, requiring 2000 tons of rail steel bars.

Contracts Placed

600 tons, Chicago sanitary district project No. 8 to Joseph T. Ryerson & Sons Inc., Chicago.

528 tons, underpass and viaduct, Waco and Fort Worth, Tex., to North Texas Steel Co., Fort Worth; Butcher & Sweeney, Fort Worth, general contractors.

396 tons, bridge, Ocklockonee Bay, Fla., to Truscon Steel Co., Youngstown, O.; George D. Auchter, Jacksonville, Fla., general contractor.

350 tons, highway, route 10, section 4A, from route 5-N to Salem street, Morris county, New Jersey, to Kalman Steel Corp., Bethlehem, Pa.; Franklin Contracting Co., general contractor.

350 tons, state bridges, Madison and Trumbull, Conn., to Truscon Steel Co., Youngstown, O.; Mariani Construction Co., New Haven, general contractor.

218 tons, Pennsylvania state highway work, Luzerne county, Pennsylvania, to Truscon Steel Co., Youngstown, O.; through W. Grant Raub, Red Lion, Pa.

200 tons, officers' quarters, Pearl Harbor, T. H., to Pacific Coast Steel Corp., San Francisco.

200 tons, dormitory, Stanford university, Stanford, Calif., to Soule Steel Co., San Francisco.

180 tons, highway structure, Queens, New York, to Joseph T. Ryerson & Sons Inc., New York; through Driscoll & Grove Inc.

155 tons, highway, route 30, section 10, Pennington by-pass, Mercer county, New Jersey, to National Steel Fabric Co. and Wheeling Steel Corp.; Edward H. Ellis Inc., general contractor.

138 tons, viaduct, Morris and Passaic counties, New Jersey, to Kalman Steel Corp., Bethlehem, Pa.

119 tons, state bridges, Hutchinson, Matagorda, Galveston counties, Texas, and Larmar-Red river span, all but 15 tons to Austin Bros., Dallas, Texas, remainder to Concrete Engineering Co., Houston; Austin Bridge Co., Dallas, general contractor.

110 tons, highway structure, Rhode Island, to Concrete Steel Co., New York, and Truscon Steel Co., Youngstown, O.

Concrete Awards Compared

	Tons
Week ended April 14	3,856
Week ended April 7	5,592
Week ended March 31	12,405
This week in 1933	751
Weekly average for 1933	3,771
Weekly average 1934	4,636
Weekly average March	6,313
Total to date 1933	51,164
Total to date 1934	75,192

One of 30,000

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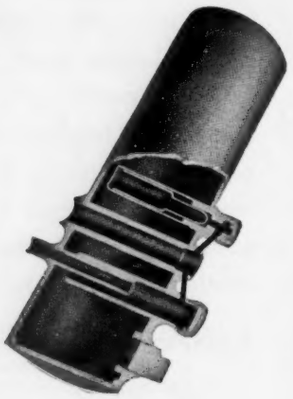

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102 tons, dormitories 4 and 8, state prison colony, Norfolk, Mass., to Truscon Steel Co., Youngstown, O.; M. Spinelli & Sons, Boston, general contractors.
100 tons, highway, Brookline, Mass., to Joseph T. Ryerson & Sons Inc., Boston.
100 tons, Indiana road work to Concrete Steel Co., Chicago.

Contracts Pending

2157 tons, Coos bay bridge, Oregon, tentative bids for April 26, May 17 and June 7; tonnage increased by 353 tons from 1804 tons as reported in STEEL, April 2.
1000 tons, Alsea state bridge, Oregon; Lindstrom & Feigenson and Parker & Banfield, Portland, low.
400 tons, M street bridge, Sacramento, Calif., for state; bids soon.
600 tons, Owyhee reclamation project, Oregon; Barnard-Curtis Co., Minneapolis, low for placing.
235 tons, undercrossing Pocatello, Idaho; bids April 13.
150 tons, Rio Grande river project; bids April 18 to bureau of reclamation, Denver, schedule 28505B.
135 tons, bridge, route 29, section 12B, North Branch, Raritan river, Somerset county, New Jersey; bids April 30.
125 tons, state bridge, Medford-Somerville, Mass.
120 tons, highway structures, Arkansas; also 78 tons of shapes; bids April 25.
110 tons, state crossing in Grand county, Colorado; bids opened.
Unstated, Pioneers' Home, Sitka, Alaska; Warrack Construction Co., Seattle, general contractor.

Pipe

Pipe Prices, Page 59

Pittsburgh—An advance in pipe prices of an indeterminate extent is evidently in prospect and it appears it probably will be one of 3½ points, or $7 a ton. With the increase of $2 a ton on skelp and tube rounds, plus higher manufacturing costs and labor rates, pipe producers are, therefore, obliged to increase selling prices. This will be the first change in the pipe schedule since July 1, 1933.

Cleveland—Anticipating a price advance in steel pipe, buyers last week covered extensively for the second quarter. While an increase in prices is expected, official announcement here was lacking late last week.

Boston—Cast iron and steel pipe buying has dropped off to smaller tonnages. Northampton, Mass., bought about 200 tons from the Burlington, N. J., foundry, paying $42.25 per ton, delivered.

Chicago—Orders for cast pipe are lagging and activity is unimproved from preceding months. While it had been anticipated that closing on the large number of projects sponsored by federal funds would be well under way by this time, delays in the receiving of government approval of bids, specifications and loans are postponing a large portion of this work until summer. With pig iron prices advanced, higher quotations on cast pipe are looked for in the near future.

New York—Cast pipe purchases for emergency relief projects have declined. Pending inquiry and awards are light, confined largely to state hospital and other public work in small lots.

Birmingham, Ala.—Base price of cast iron pipe will be advanced at once, confirmation being given here. This a result of advancing pig iron prices. Demand for pipe still is rather slow with shops operating around 50 per cent of capacity.

Cast Pipe Placed

725 tons, waterline extension, Pittsburgh, Tex., to American Cast Iron Pipe Co., Birmingham, Ala., through W. G. Cullum Co.
500 tons, Harrisburg, Pa., to Donaldson

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INDUSTRIAL BROWNHOIST

Iron Works, Emaus, Pa.
300 tons, 6 to 12-inch, Brookline, Mass., to Donaldson Iron Works, Emaus, Pa.
205 tons, 6 and 12-inch, Northampton, Mass., to United States Pipe & Foundry Co., Burlington, N. J., at $42.25, net ton, delivered.
175 tons, 12-inch, Gardner, Mass., to R. D. Wood & Co., Florence, N. J.
100 tons or more, annual requirements, Milton, Mass., to Warren Foundry & Pipe Co., Phillipsburg, N. J.
Unstated tonnage, 1500 feet, watermains Pascagoula, Miss., to National Cast Iron Pipe Co., Birmingham, Ala.

Steel Pipe Placed

160 tons, steel pipe, elbows and valves, United States engineer, Kansas City, Mo., to Black, Sivalls & Bryson, Kansas City.
100 tons, 20-inch, United States engineer, Jacksonville, Fla., to Lancaster Iron Works Inc., Lancaster, Pa.

Cast Pipe Pending

525 tons, Ashville, O., also 1000-gallon steel tank.
216 tons, 6 to 16-inch, class 150, Roseville, Calif.; bids in.
140 tons, Monterey, Calif.; bids rejected.
Unstated tonnage, 30,250 feet of 36-inch, 16,100 feet of 30-inch, 6100 feet of 24-inch, watermains, Miami, Fla.; bids April 18, H. E. Ross, clerk.
Unstated tonnage, about 9100 feet, 6 to 20-inch, extensions to sewage system, Winston-Salem, N. C.; bids April 18, Harry L. Shaner, commissioner of public works.
Unstated tonnage, 8900 feet of 1 inch, for Fort Lewis, Wash.; bids in.

Steel Pipe Pending

1200 tons, pontoon and shore pipe, United States engineer, Memphis, Tenn.; Bartlett, Hayward & Co., Baltimore, low, bids April 5.

Wire

Wire Prices, Page 59

Pittsburgh — Just as the $2 to $5 a ton advance on wire products went into effect on April 12, a counter-filing by a leading interest which becomes effective April 20 reduced the advance on many items. There was no change from the original intention to advance nails to $2.60, Pittsburgh, but the latter filing will make the following changes: plain manufacturing wire up $2 instead of $3; barbed wire up $3 a ton instead of $5; bale ties up $5 instead of $6; and spring wire, no advance as against a former $3 increase.

Cleveland—Consumers have covered second quarter requirements, reflecting a broad, miscellaneous demand. Specifications have increased, and production is expected to move up steadily during the quarter. Dates for filing price advances on wire and wire products, as on other finished steels, were not uniform, so that some companies had a few days longer than others in which to book at the old figures.

Chicago—Wire producers are accumulating heavy order books as consumers seek to obtain protection on second quarter needs at current prices. Advances of $3 to $5 a ton on various products become effective April 20, when larger users are expected to have made commitments. Consumption is well maintained and the general tendency still is moderately upward.

Boston—Wire specifications are heavier, with some increase in drawing mill operations. There has been a notable gain in demand for wire rope. Specialties produced in New England plants are being advanced in line with plain wire and other lines, already announced. Bright wire, under the new schedule will be 2.45c, Worcester.

New York—Delay is expected in putting new prices on wire into effect at some points as some producers have withdrawn prices recently filed. The reason is said to be that one producer has filed a $2 advance on wire against $3 by others.

Philadelphia — Milder weather is expected to accelerate movement of wire nails and other wire products shortly. Manufacturing requirements, as well as building needs, have lagged, and protective covering has not been as brisk in wire products here as in some other lines.

Pig Iron

Pig Iron Prices, Page 60

Pittsburgh—Effective with this week, on April 17, all pig iron base prices at Sharpsville, Pa., and Youngstown, O., will incorporate $1 a ton advance. However, at the Neville Island base the advance effective the same day will be $1 a ton on basic iron and 50 cents a ton on all other grades. Therefore, markets on basic, bessemer, malleable and No. 2 foundry grades are on a parity in this and the Valley districts and the former 50-cent per ton differential, which has been observed for many years between the Valley and Pittsburgh pig iron, is abolished. Through last week, heavy contracting at the old prices featured the local market although the larger users, which included the nonintegrated steel producers here, did not negotiate any unduly large tonnages. In fact one large iron inquiry here was dropped.

Cleveland—Shipments by lake furnace interests so far this month are approximately 20 per cent above the tonnage delivered in the comparable period in March. Some consumers who had previously placed contracts for second quarter increased the amounts when producers announced a price advance of $1 a ton, which is now in effect, bringing the base for No. 2 foundry and malleable to $18.50, Cleveland.

Chicago—Small as well as large pig iron consumers have taken advantage of the opportunity to contract for second quarter needs at former prices of $17.50, furnace, for No. 1 foundry and malleable prior to the increase of $1 a ton effective April 16. While some speculative buying is noted, this is the exception rather than the rule and most tonnages contracted for cover only estimated needs for the coming three months. These contracts indicate a prospective gain in shipments during this quarter compared with the past three months. Shipments so far in April are slightly heavier than a month ago, with foundry operations still tending upward.

Boston—Stimulated by the $1 advance on all grades of pig iron, effective April 20 at Everett, Mass., consumers are contracting and buying heavier. More small buyers are in the market and indications are that most consumers will take enough iron for third quarter consumption.

New York—Contracting continues brisk, consumers covering against advances going generally into effect this week. The new prices on foundry iron are $20.99, delivered Newark, and $21.77, Brooklyn; and on malleable $21.39, Newark, and $22.27, Brooklyn. Southern foundry iron will be $20.58, Newark, and $21.39, Brooklyn. Spot specifications are better, but far from heavy.

Philadelphia—With price advance of $1 generally effective this week on most grades of pig iron, most consumers are now fairly well covered for the quarter. The new delivered prices here are $20.26 on No. 2 foundry, $20.76 on malleable and $19.76 on basic. Advances of $1 a ton are also noted in the delivered price on southern iron, to $19.88 for No. 2 foundry. Spot specifications are improved, but nevertheless disappointing to most producers. Approximately 6000 tons of Dutch iron arrived here recently, bringing the total of this iron to have been received here within the past three weeks up to about 10,000 tons. Most of this is reported to be against contracts with eastern pipe foundries.

Buffalo—Furnace interests here have announced an increase in prices

to take effect on all sales made after April 19, the markup being $1 a ton on all grades of foundry and malleable. There has been heavy covering by the trade adding to the already large bookings of the past six weeks. Shipments are showing a fair improvement over March. One furnace in this district is temporarily out of production because of shortage of ore. Five others continue to produce iron.

Cincinnati—Announcement of an advance of $1 a ton on pig iron, with 10 days notice, caused melters to rush to cover for second quarter requirements, bookings for the week exceeding 10,000 tons of which about two-thirds was northern iron. Southern furnaces retained the 38-cent differential, the new price of No. 2 foundry iron being $19.13 whereas northern iron is $19.51, delivered Cincinnati. Hamilton is the basing point on quotations.

St. Louis—During the past 10 days, volume of buying has been heavy, estimates indicating that 28,000 to 30,000 tons, including all grades, has been sold since the middle of March. The $1 price advance results in the following quotations, delivered St. Louis: From Granite City, Ill., No. 2 foundry $19 per ton, malleable $19.50 and basic $18.50; from Birmingham, Ala., No. 2 foundry $18.62 and basic $18.50.

Birmingham, Ala.—Second quarter purchases will aggregate higher than for the first three months of the year, as a result of the advance of $1 in base price. Melters are buying ahead, and expectations are that consumption will increase still further.

Toronto, Ont.—Sales held to the current weekly average. No buying ahead is being done, but repeat orders are more numerous. Daily melt is holding arount 40 per cent of capacity.

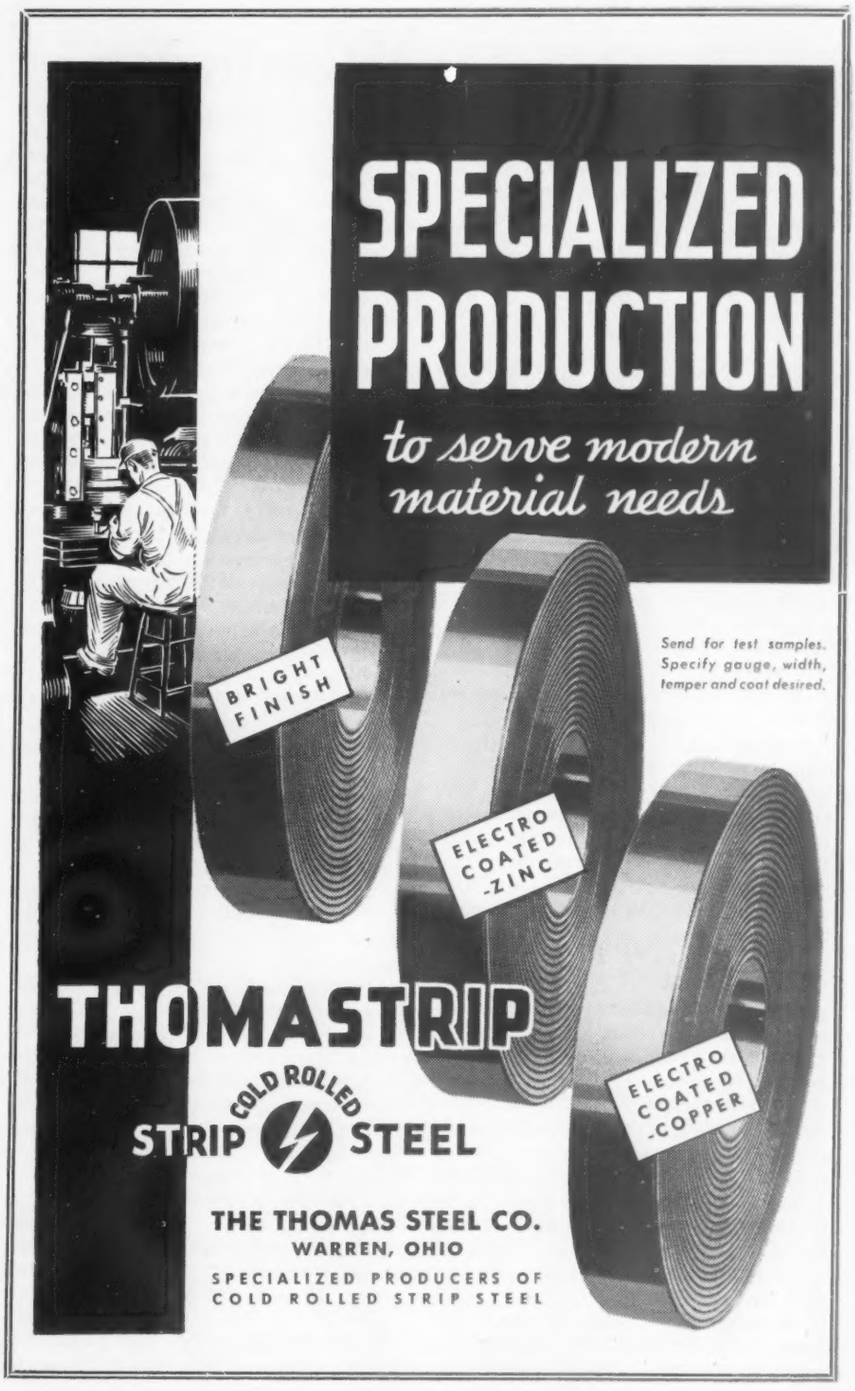
Scrap

Scrap Prices, Page 61

Pittsburgh—Since the buying early last week of an independent mill at $14.25 for a lot of something under 5000 tons of No. 1 heavy melting steel, the market has drifted without test. The best reason for $14.75 to $15.25 being paid for Baltimore & Ohio and Pennsylvania scrap last week is desire of mills to buy good scrap and rid themselves of the possibility of rejections, which in some cases have been numerous recently. Relatively small transactions in machine shop turnings, reaffirm the $10.50 to $11 market and the same is true in blast furnace scrap at $8.50 to $9, railroad specialties at $16 to $16.50 and in hydraulic compressed sheets at $14 to $14.50.

Chicago—Iron and steel scrap is quieter following recent heavy buying. All leading consumers participated in these purchases and requirements for 60 days are covered in most instances. Buying consequently is expected to be light for the present. Prices generally are steady, although dearth of new business has induced sellers in some instances to offer old material at prices slightly below those recently paid. Pending additional buying, heavy melting steel may be continued $11.50 to $12.

Cleveland—Activity is increasing among scrap-consuming industries, both foundries and steelworks. Recent heavy buying limits present need for further commitments but shipments are active. Some scrap is



arriving by lake from Detroit. No change has been made in quotations.

Boston—Scrap is more active and prices steadier. New England steelworks are taking shipments, but the leading consumer at Worcester is not actively seeking tonnage, although material within the Boston freight rate zone is being bought, the buyer paying up to $9.50 for No. 1 and $8.50 for No. 2. Some local scrap in small lots is being bought slightly under these prices.

New York—Demand for No. 2 melting steel is more active with one Eastern Pennsylvania steel works paying a premium in this market for rail shipment, involving a large tonnage. Most eastern Pennsylvania mills are taking shipments while buying continues for barge loading, canal and export shipment, at unchanged prices.

Philadelphia—The scrap market is perceptibly stronger but pending tonnage buying the leading grades are unchanged. No. 1 and No. 2 heavy melting steel are being loaded here, against orders placed prior to March 1. The No. 1 steel is for Japan and the No. 2 is for England and, it is believed, Italy.

Buffalo—Some small lots of heavy melting steel are reported to have been sold to Bethlehem Steel Co. on its offer of $12.50 for No. 1, both by local and outside dealers, the latter to make shipments by water. Large handlers in many instances are holding for $13 and will not sell for less. There have been substantial sales of No. 1 machinery cast at $12 and stove plate at $11. Deliveries are heavy.

Detroit—The market continued dull last week but no further declines have been recorded although production continues to exceed local consumption. Not only are motor plant scrap accumulations heavy but the same condition exists in dealers' yards and on local docks so that probably several hundred thousand tons of scrap are stored awaiting shipment.

Cincinnati—Quotations on iron and steel scrap are strong but unchanged except sheet clippings, which are advanced 50 cents on active demand. Mills are taking offerings of preferred grades more freely.

St. Louis—Purchasing of iron and steel scrap continues moderate, both buyers and sellers being disposed to await developments. Prices are steady. Fractional reductions are recorded on knuckles and couplers and hydraulic sheets.

Birmingham, Ala.—Buying of heavy melting steel did not develop material change in conditions and the market is sluggish with plenty of scrap available.

Toronto, Ont.—Trading in iron and steel scrap is picking up slowly, with demand specialized. Steel grades are moving slowly in the Toronto district, with Hamilton mills out of the market. Montreal dealers, however, report better demand. Steel grades are heavily stocked but some iron grades are scarce. Dealers are taking scrap at the minimum price but are not bidding for steel lines.

Warehouse

Warehouse Prices, Page 62

Pittsburgh—Last week showed a lively increase in demand for warehouse steel. Shipments were better than any week in March, according to local jobbers. No change has been made in warehouse prices.

Cleveland—Both size and number of orders this month show improvement over the comparable days in February. Some purchasers recently have anticipated price advances as warehouse quotations are based on mill prices, though definite announcements were not made up to late last week.

Chicago—Sales have increased since recent advances in mill prices. While warehouse quotations are expected to be revised correspondingly, no changes have been made yet.

Boston—Warehouse volume is heavier with jobbers outside the immediate Boston district noting more improvement, especially in the Providence, R. I., district. Jobbers are expected to announce price increases on various products soon.

New York—Warehouse steel prices on products on which mill quotations have been advanced are expected to be increased shortly. Small orders being taken by jobbers are numerous, but the aggregate tonnage is somewhat below that of the recent fortnight.

Philadelphia—While a general advance is impending, in line with price increases at the mills, it may not become effective for another fortnight.

Cincinnati—Jobbers anticipate an immediate adjustment upward in prices in accord with mill increases. Demand is being maintained on a level with March.

Detroit—Shipment of steel products from warehouse held through last week at a satisfactory level, total tonnage being as good as the first week of April or the weekly average through March. March, from the standpoint of warehouse shipments, was the best month of the first quarter and April bids fair to at least equal this showing. For the time being warehouse prices are unchanged.

St. Louis—Iron and steel warehousemen report slight increase in purchasing, due to expectations of price advances based on the upturn in mill quotations. Business otherwise slightly betters the steady improvement which began early in the year.

Metallurgical Coke

Coke Prices, Page 59

Since the allowable deduction of 25 cents a ton was made by furnace coke producers for yearly contracts, beehive coke makers who produce the foundry grades have been desirious of extending the differential to both common and premium coke for foundry use. Late last week it appeared likely that the 25-cent per ton allowance would be made from the present $4.60 oven price on common foundry coke if the buyer enters into a 12-month contract. It also appeared that the allowance would be made in premium foundry coke, from the present price of $5.35, ovens. For prompt shipment and on quarterly contracts, furnace coke continues quoted $3.85, Connellsville ovens, but for yearly contracts the market still is $3.25. Coke buying has fallen off to a noticeable degree and the recent advance of 35 cents per ton as of April 1 has limited buying.

By-product coke has been advanced 50 cents per ton at Birmingham as a mine strike has reduced production. Metallurgical coke is moving heavily in the St. Louis district and second quarter contracting has been larger than expected.

Shipments at Chicago are better than in March and prices have not been changed from $8.50, ovens, and $9.25, delivered, Chicago. Foundry grades are unchanged in price at Cincinnati but domestic coke has been reduced 50 cents.

Semifinished

Semifinished Prices, Page 59

Advanced prices are now quoted by semifinished steel producers at the following levels: Sheet bars, $30, Pittsburgh, Youngstown, O., and Cleveland; billets, blooms and slabs, $29; and forging quality billets, $34, Pittsburgh. Skelp is quoted 1.70c, Pittsburgh, wire rods, $38, alloy billets, $51, and tube rounds, 1.85c. Whether alloy ingots will be advanced to $51, Pittsburgh, has not been determined.

Pacific Coast

Pacific Coast Prices, Page 59, 60, 62

San Francisco—(*By Air Mail*)—Awards of reinforcing bars last week aggregated over 7000 tons, including 6000 tons for Boulder dam, placed with Truscon Steel Co., Youngstown, O. Pacific Coast Steel Corp. secured 200 tons for officers' quarters at Pearl Harbor, T. H., and Soule Steel Co. took 200 tons for a dormitory at Stanford university. Unnamed interests were awarded 135 tons for eight structures in Los Angeles county, California, for the state. A bridge over the Sacramento river at M street, Sacramento, Calif., will come up for bids shortly. Bids have been opened on 300 tons for a filtration plant at Fort Peck, Mont.

No plate business of size was reported placed. Close to 5000 tons is involved in four tunnels for the Fort Peck dam in Montana, up for bids April 11. Los Angeles will open bids April 23 for 2500 tons for liner plates.

The structural shape market was far from active, less than 2000 tons, in all, being placed. The general contract for the 1200-ton Douglas bridge in Alaska was let to A. Dishaw of Juneau, Alaska. Unnamed interests took 128 tons and 120 tons for crossings in Pueblo County, Colo., and Uinta County, Wyo., respectively. Bids were opened on 5000 tons for a power house at Boulder City, Nev. The M street bridge, Sacramento, Calif. will require 2035 tons. New inquiries include 600 tons of tunnel structures for the metropolitan water district, Los Angeles. Pending business now aggregates over 26,000 tons.

Roseville, Calif., has opened bids on 216 tons of 6 to 16-inch pipe. Monterey, Calif., rejected bids on 140 tons.

Northwest More Active

Seattle—Certainty of price increases is stimulating buying, business being more active than in months.

Five tenders were submitted to the Oregon highway commission for the Alsea bridge, the lowest being a joint bid of $685,000 by Lindstrom & Feigenson and Parker & Banfield, Portland, Oreg. Award is pending. This job involves 1000 tons of reinforcing and 150 tons of shapes. Wallace Bridge & Structural Steel Co., Seattle, booked 300 tons of structurals for two state bridges in King and Lewis counties, West Coast Construction Co., Seattle being the general contractors.

Andrew Sather, general contractor for a state undercrossing in Spokane county, is reported to have awarded 200 tons of shapes to an unnamed eastern interest. For the University library addition, bids at Seattle April 17, 200 tons of structurals are required. Bids were received April 13 at Pocatello, Idaho, for a subway 818 feet long, taking 235 tons of reinforcing and 615 tons of shapes.

War department has awarded five contracts aggregating $636,375 for the Fort Peck, Mont., dam project, including: Bucyrus-Erie Co., Milwaukee, $148,497 for ladders and spare dredge parts; Republic Steel Corp., Youngstown, O., $4744 and Jos. Greenspoon & Son Pipe Corp., St. Louis, $6183 for steel pipe for a temporary water system. Barnard-Curtis Co., Minneapolis, was low at $154,296 for structural work on the north canal, Owyhee reclamation project, Oregon, involving 600 tons of reinforcing, installing gates and laying 54 and 60-inch pipe.

R. F. Walter, reclamation chief engineer, and James O'Sullivan, Spokane, secretary, Columbia basin commission, announce bids will be invited late this month for the main Coulee dam contract. Work is to begin June 1 and be completed Oct. 1, 1937. Separate bids will be asked for the power machinery.

Cast iron pipe specifications are light due to want of municipal financing. The scrap market is firm and unchanged with Japanese interests looking for attractive tonnages.

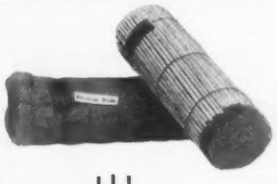
Sales of pig iron in the last 10 days have exceeded last year's totals. Cast iron scrap is cheaper in proportion than No. 1 Columbia pig iron, quoted at $22.50, f.o.b. buyer's plant, until June 30. Some special English hematite, 0.05 phosphorus, is being imported in small lots for special foundry jobs. British coke has advanced from $14 to $15, f.o.b. plant, the rise originating at source due to exchange and improved demand. The movement to this section is steady and in fair volume.

Steel in Europe

Foreign Steel Prices, Page 62

London—(*By Radio*)—Production of pig iron and steel ingots in Great Britain increased in March. Pig iron totaled 503,600 tons, a daily average of 16,786 tons, compared with 414,000 tons and a daily average of 14,800 tons in February. Steel ingot production in March was 829,700 tons, a daily average of 27,656 tons, compared with a total of 707,500 tons and a daily average of 25,268 tons in February. Active stacks numbered 95 in March and 90 in February. The increase in daily average pig iron in March over February is 13.4 per cent, and in steel ingots 9.4 per cent.

Easter holidays brought a lull in trade but the outlook generally is



Wire

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Flat—Round and Half Round
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Sizes ½" to No. 40 W & M Gauge (.007")
All finishes
Also Screen Wire Cloth

The Seneca Wire & Mfg. Company
Established 1905
Fostoria, Ohio
Warehouses and Representatives in practically all principal cities

encouraging in all districts. Additional shipments have been made to Russia and China. Tin plate trade is improving.

The Continent reports markets are active but purchases are in small tonnages. Great Britain is buying semifinished steel and bars.

Equipment

Chicago — Slight improvement in demand for some machinery was noted the past week following a dropping off in orders during late March. Inquiries and sales usually involve small lots and a fairly large portion is coming from government agencies. Machine tool inquiries for federal arsenals are more active although no action has been taken on proposed purchases for the Rock Island, Ill., arsenal. St. Louis-San Francisco railroad has ordered eight units from its recent inquiry, including welding equipment.

Boston—More machine tool volume is originating in New England with a Springfield, Mass., plant making electrical household appliances continuing to buy equipment, having already placed a fair list of machinery. Demand is largely limited, with few exceptions to one or two tools at a time. Several Worcester, Mass., district plants, including one grinding machine maker still operate full or double shifts.

New York—Inquiry for machinery and equipment is heavier, largely for specials with demand for standard tools rather dull. While there are no large lists out, inquiry for one or two tools is fairly widespread among industrial plants. General Electric Co. has bought and continues to inquire for equipment for its refrigerator department. Another buyer is the Colt Patent Fire Arms Mfg. Co., Hartford, Conn. A heavier demand for replacement equipment in various eastern arsenals is also developing while navy inquiry holds active.

Cleveland—An order from a Japanese automobile manufacturer for 12 turret lathes has been received by the Warner & Swasey Co. here. The order calls for a variety of models and represents one of the largest single export orders received in some time. Shipment will be made in about two months. National Acme Co. is low on three automatic screw machines for delivery at the Newport, R. I., navy yard. Bardons & Oliver are low on three turret lathes for the same yard, bids being opened April 10.

Nonferrous Metals

Nonferrous Metal Prices, Page 60, 61

New York—Leading nonferrous metals pushed upward pricewise during the past week with the exception of tin. Buying was in heavy volume.

Copper—Consumers entered the market actively through mid-week when buying tapered off somewhat. Tonnage booked probably was in excess of 10,000 tons. Prices moved upward an additonal ½-cent with electrolytic 8.50c, Connecticut, and prime lake metal 8.62½c, Midwest. Brass ingot advanced ¼-cent and all copper and brass products with the exception of copper and brass pipe and welding rod ½-cent.

Lead — American Smelting advanced its price $2 a ton Monday to 4.10c, New York, and midwestern producers $1 a ton to 3.95c, East St. Louis. On Tuesday, prices went up $3 a ton further to 4.25c, New York, and 4.10c, East St. Louis. Buying was heavy during most of the week but tapered near the close.

Zinc — Recent weakness disappeared and prime western metal firmed up to 4.40c, East St. Louis. Consumers came into the market for substantial tonnages. Surplus stocks increased about 900 tons in March.

Tin—Prices declined steadily in sympathy with a weaker market in London and lower sterling exchange rates. Straits was close to the 55.50 cent level as the week closed compared with 56.37½c in the previous period. Acceptance of the buffer pooling plan by the International Tin committee to stabilize prices resulted in the decline.

Antimony—Spot metal was firm at 7.95c, duty paid. Some small-lot business was done.

Aluminum—Both virgin and remelt grades appeared slightly firmer but prices held unchanged.

Silver—Spot metal dropped to 46.00c an ounce.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 59

Bolt and nut manufacturers have not announced prices of their products but an advance from present levels is expected this week. Rivet prices have been advanced $5 per ton to 3.00c, base, Cleveland, for second quarter, effective April 16. The price at Chicago has also been advanced $5, to 3.10c. The price at Birmingham, Ala., which has been the same as at Chicago, is now made $1 higher, at 3.15c. Small rivets are up 5 points to 70 and 5 off list.

Demand in general is strong, with automotive and agricultural implement manufacturers taking satisfactory shipments.

Coke By-Products

Coke By-Product Prices, Page 59

New York—Industrial demand for phenol has increased materially with prices unchanged for this quarter. A heavy inquiry for toluol prevails, largely from the lacquer and chemical trades, with little material available for spot shipment. The same tight market holds for benzol, xylol and solvent naphtha. Naphthalene shipments are seasonally active. Sulphate of ammonia is unchanged.

Ferroalloys

Ferroalloy Prices, Page 60

Ferromanganese specifications continue to expand as steelmaking operations throughout the country improve. The market is unchanged at $85 duty paid, eastern seaboard. Domestic spiegeleisen, 19 to 21 per cent also is moving more freely, with the market steady at $26, furnace.

Quicksilver

New York—Quicksilver prices are unchanged here in a quiet market. Small lots are $76.50, a virgin flask of 76 pounds, and round lots $76 a flask. Available supplies are reported limited.

Here and There In Industry

AMERICAN SHEAR KNIFE CO., Homestead, Pa., recently organized, has been equipped to manufacture solid steel shear blades for the steel and metal fabricating industries. The plant is now in production. H. Stanley Rogers, formerly general manager of Heppenstall Co. and B. B. Weinberg, formerly vice president in charge of sales of the Heppenstall Co., are officers. S. C. Steiner, who for 16 years was a salesman for the Heppenstall Co. in the Pittsburgh district has become affiliated with the company as Pittsburgh district representative. The company has negotiated a reciprocity sales arrangement

with A. Finkl & Sons Co., Chicago, representing the latter in the Pittsburgh district for the sale of its die blocks and forgings and the Chicago concern will represent the American company in Chicago for the sale of its shear knives.

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Mackintosh-Hemphill Co. has moved its general offices from the Point building to Ninth and Bingham streets, Pittsburgh.

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Timken Roller Bearing Co. has moved its Pittsburgh district sales office to 414-416 North Craig street. John L. Young is district manager of the Pittsburgh office.

□ □ □

Bridgeport Machine Co., Wichita, Kans. will stock and distribute products of American Steel & Wire Co. Chicago in the mid-Continent and gulf coast fields.

□ □ □

Sheffield Machine & Tool Co., Dayton, O., has appointed Don F. Johnson & Co. Inc., 156 Main street, Buffalo, its sales representative for the Buffalo district.

□ □ □

National Tank Co., Tulsa, Okla., is occupying its new offices and warehouse in Houston, Tex. This office is sales and distributing headquarters for Texas, Louisiana, Arkansas and New Mexico. Floyd Senter is manager.

□ □ □

Hughes Tool Co., Houston, Tex., has raised wages of its employes, numbering 1600, bringing some rates to the level of 1929. M. E. Boehm is general manager.

□ □ □

Nason Mfg. Co., New York, has taken over exclusive manufacture of Detroit steam traps, including return, vacuum, combination and separating traps.

□ □ □

Charles Dreifus Co., Philadelphia, scrap dealer, has opened a New York office in the Salmon Tower, 11 West 42d Street, with Charles J. Hogan and Charles Dreifus, Jr., in charge.

□ □ □

Babcock & Wilcox Tube Co., New York, has enlarged territory of its Tulsa, Okla., office to include Oklahoma and the southern half of Kansas. C. J. Hochenauer is in charge.

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Barde Steel Co. and Doran Co., both of Seattle, have been appointed distributors of Enduro stainless steel by Republic Steel Corp., Youngstown, O.

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Republic Steel Corp., Youngstown, O., has appointed Gate City Iron Works, Omaha, distributor is its toncan copper molybdenum iron. A stock of sheets of this metal will be carried.

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City Machine & Tool Works, Dayton, O., has appointed Don F. Johnson & Co. Inc., 156 Main street, Buffalo, its representative in the Buffalo district for its standard drills, jigs and locks.

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Timken Roller Bearing Co. and Timken Roller Bearing Service & Sales Co., Canton, O., are moving their Pittsburgh district office to their new building, 414-416 North Craig street, Pittsburgh.

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Wackman Welded Ware Co., St. Louis, has opened a warehouse and delivery system at 516 South Franklin street, Chicago, with V. A. Holmes in charge of sales. Complete stocks of standard sizes of steel drums will be maintained.

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Edgar M. Moore & Co., Farmers Bank building, Pittsburgh, has been appointed representative in western Pennsylvania for Richardson Co., Melrose Park, Ill., for the sale of its composition material used in roll neck bearings and gear blanks.

□ □ □

Pennsylvania Lubricating Co., an affiliate of Standard Oil Co. of Pennsylvania has changed its name to Penola Inc. The company, with plants at Pittsburgh, Baltimore, Baton Rouge, La., and Eldorado, Kans., manufactures industrial lubricants.

□ □ □

Despatch Oven Co., 622 Ninth street Southeast, Minneapolis, has started manufacture of a dry gold mining machine for recovery of gold from placer sand or ore without the use of water or chemicals. It was developed by A. E. Grapp, president of the company

□ □ □

Emsco Derrick & Equipment Co., Mid-Continent division, Dallas, Tex., has moved its offices from the plant on Maple avenue to the fourth floor of the Continental building. L. R. McCollum is manager. Continental Supply Co., occupying the first three floors of this building, is its agent.

□ □ □

Grundy & Lampard has been organized at Stratford, Conn., to conduct a commercial heat treating plant, in which modern equipment for heat treatment of metals has been installed. The firm is composed of George H. Grundy and Charles A. Lampard, formerly with Poldi Steel Corp., New York.

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Spencer Kellogg & Sons, Buffalo, have retired from the production of foundry core oil and has turned over this department to the Werner G. Smith Co., Cleveland, including formulas, goodwill and unexpired contracts. Manufacture of these oils will be continued by the Smith company without change.

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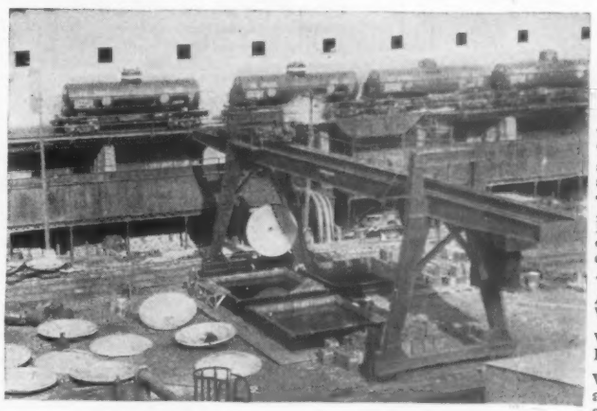
Independent Foundry Supply Co., established in 1930, has removed to new quarters at 2143 Bay street, Los Angeles. Steven Mocsny, formerly a foundryman in the East and for five years connected with the Snyder Foundry Supply Co., Los Angeles, is manager. A. M. Barker, formerly connected with S. Obermeyer Co., Chicago, and previously with Rogers, Brown & Co., also is connected with the Independent Foundry Supply Co.

Woolford Wood Tanks



Three Woolford Tanks, each 16 feet square used for No. 1 pickle finish on stainless iron or steel.

FOR ALL PICKLING OPERATIONS

WOOLFORD WOOD TANKS are constructed of carefully selected tank lumber — Lined or plain — Anti-acid rods, Lead Extruded Iron rods, or plain iron rods incased in *Woolford Anti-acid Plastic.*

Ask about our Special Wood Tank Lining.

Wood or Steel Tanks Rubber Lined.

Wood and steel tanks are also built to any specifications.

Complete information furnished upon request.

G. WOOLFORD WOOD TANK MFG. CO.

Parschall P. O. **PHILADELPHIA, PA.** *Factory:* **Darby, Pa.**

Construction and Enterprise

New England

WALLINGFORD, CONN.—The borough, A. L. Pierce, superintendent of electric light department, 32 South Elm street, plans rebuilding the burned municipal electric light and power plant at cost of about $28,500.

ATHOL, MASS.—Board of selectmen, 584 Main street, plans construction of a municipal electric light and power plant to cost $30,000 or more.

BOSTON—Roberts Boiler & Iron Works Inc. has been organized by Charles G. Keene, 156 Bellevue street, West Roxbury, Mass., to manufacture tanks, boilers and plate products.

BOSTON—State board of education, State House, has had plans prepared for a group of four shops, laboratories and other facilities at the state normal school at Fitchburg, Mass., to cost about $100,000. S. W. Haynes & Associates, 336 Main street, Fitchburg, Mass., are architects.

BLANDFORD, MASS.—Board of selectmen is planning to rebuild the municipal waterworks pumping plant recently burned. New pumping equipment will be required.

SPRINGFIELD, MASS.—Swett Bros. Heating & Appliance Co. has been formed to manufacture heating equipment, by Reginald K. Swett and Russell F. Swett, 147 Dwight street, Springfield, Mass.

New York

ALBION, N. Y.—Village trustees plan construction of a municipal electric light and power plant to cost $100,000 or more. L. Reynolds, Geneva, N. Y., is engineer.

BUFFALO, N. Y.—John W. Cowper Co. has been awarded general contract for constructing school 37 in Buffalo at its bid of $431,300.

BUFFALO—Board of education has plans by D. G. McNeil, bureau of school architects, for the Kensington high school, to cost $1,198,000. A PWA loan has been granted.

BROOKLYN, N. Y.—Natisch Gear Works Inc. has been organized by William Natisch, Malverne, Long Island, to manufacture gears and transmission equipment.

LONG BEACH, N. Y.—Board of education has plans by W. S. Sneider, 101 Park avenue, New York, for a school to cost about $1,200,000. A PWA loan has been applied for.

LONG ISLAND CITY, N. Y.—Rototiller Inc. 21 Forty-fourth avenue, manufacturer of agricultural machinery and parts, is increasing its capital $225,000 to provide for expansion of production. C. W. Kelsey is president.

NEW YORK—Liquid Measure Corp. has been formed by Edward C. Phillips, 224 Jefferson avenue, and E. N. Castle, 1040 Carroll street, to manufacture measuring devices and equipment.

NEW YORK—Standard Aircraft Corp. has been formed to manufacture airplanes and parts, with $500,000 capital, by James Callanan, Darien, Conn. Herbert B. Bolton, 110 East Forty-second street, New York, is correspondent.

NEW YORK—Reisberg Iron Works Inc. has been formed by Jacob Reisberg, 612 East Ninth street, and associates. Structural iron products will be produced.

NEW YORK—Hoffman Metal Products Co. Inc. has been formed by Grover C. Hoffman, 1411 Fifth avenue, New York, and Louis Vuolo, 2124 East Seventh street, Brooklyn, to manufacture metal goods.

PENN YAN, N. Y.—William B. Manley, village clerk, will take bids April 26 for construction of sewage disposal plant to cost about $48,000.

New Jersey

BURLINGTON, N. J.—Burlington Distillery Co., a recently formed concern, has taken over the plant of the former Burlington Industrial Alcohol Co. and will convert it into a distillery at cost of about $50,000. A 1-story addition will be built.

FREEHOLD, N. J.—Buck Engineering Co. Inc. has been organized by Karl O. Baird and David T. Buck, 39 South street, to manufacture oil burners and equipment.

GARFIELD, N. J.—E. C. Machine Works Inc. has been formed by Edward Calderio, 111 Sherman place, to manufacture machinery, taking over the E. C. Machine shop, 125 Clark street, Garfield, N. J.

JERSEY CITY, N. J.—Jerome S. Katz & Co. Inc., manufacturer of metal products, has leased about 25,000 square feet in a building at Caven Point and Pacific avenues, Jersey City, N. J., where a smelting and refining plant will be established.

NEWARK, N. J.—Cap Screw & Nut Co. of America Inc., 79 Polk street, Newark, has leased an entire floor at 50 Essex street, where it will establish its manufacturing operations with double present facilities.

Pennsylvania

PITTSBURGH—City has retained N. S. Sprague, engineer, Bessemer building, to make a survey, with plans and specifications, for a municipal garbage and rubbish disposal plant, to cost about $900,000.

WARREN, PA.—United Refining Co. has had plans prepared for extensions at its refinery, including fractionating tower and other equipment, to cost about $75,000.

Ohio

AKRON, O.—Electro-Hydraulic Machinery Co. has been formed by Paul Zarrs and D. L. Van Buskirk, 402 Ohio building, to manufacture hydraulic machinery and appliances.

AKRON, O.—Ball Lift Corp., E. V. Hampton, Akron, secretary and treasurer, newly organized, is capitalized for $125,000 and will provide a plant for the manufacture of mechanical lift devices.

BRADFORD, O.—Bids will be asked soon for construction of a municipal electric light and power plant to cost $83,000, with equipment. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is engineer.

CLEVELAND — Pressure Castings Inc. has been incorporated with $35,000 capital to manufacture die castings, by David Benjamin, president. A plant is being established at 12435 Euclid avenue.

DAYTON, O.—Brownell Co., 300 North Findlay street, manufacturer of boilers, tanks and stokers, will build a 1-story boiler and plate shop to replace its burned shop, including overhead crane, at cost of about $70,000.

DAYTON, O.—City Machine & Tool Works has acquired the Paulins Tool & Engineering Co., Detroit, and is manufacturing an improved line of standard drill jigs and standard locks. Frank U. Paulins remains with the Detroit office in an engineering and sales capacity.

FREMONT, O.—Fremont Tool & Die Co., 434 North Wood street, is planning to build an addition to its plant, 28 x 50 feet.

LIMA, O.—Relay Motors Corp. plant will be sold at a federal receiver's sale, the proceeds to be applied to the claims of the Hercules Motor Corp.

LISBON, O.—Plant of the National Brass & Copper Co. has been purchased by C. W. Hays and Floyd Rose, who are now in charge of the Lisbon plant.

Michigan

ADRIAN, MICH.—State administrative board is planning construction of a boiler house at the girls' training school here to cost approximately $30,000.

ANN ARBOR, MICH.—Buhr Machine & Tool Co. is planning to build a factory addition. Fry & Kasurin, Ann Arbor, are architects.

DETROIT—Republic Scrap Iron & Metal Corp. has been incorporated to deal in scrap iron, by Abe Durbinsky, 3267 Cortland avenue.

DETROIT — Continental Engineering Inc., 419 East Hendrie street, has been incorporated to deal in tools and machinery, by Evelyn M. Haley, 13728 Thornton avenue.

DETROIT—Modern Aviation Motor Corp. has been formed by Charles Mosier, 6471 Minock avenue, to manufacture aviation appliances and equipment.

DETROIT—Barkeley-Mattson Corp., 8227 Hamilton street, manufacturer of automotive equipment, has leased a plant at Pontiac, Mich., and will move its operations there and enlarge production.

FLINT, MICH.—Hill Brewing Co. has awarded contract to Koepke Bros., Saginaw, Mich., for a bottling

plant unit to cost about $30,000. Total cost of the brewing plant will be $100,000. George Bachman, Flint, is architect.

JACKSON, MICH. — Ann Arbor Iron & Metal Co. has been incorporated with 20,000 shares no par value to conduct a scrap metal business, by Samuel Lazebnick, 103 West Ganson street, Jackson, Mich.

KALAMAZOO, MICH.—Upjohn Co. will take bids shortly for a 10-story factory and office building at an estimated cost of $200,000.

SAGINAW, MICH.—Board of supervisors of Saginaw county will include a power plant and water supply at the juvenile detention home, to cost about $225,000 for entire project.

Indiana

ANGOLA, IND. — Ega Products Corp. has been incorporated to manufacture carburetors and automobile parts, by Raymond T. Roush, E. G. Atkins and John A. Roush.

Illinois

AURORA, ILL.—Garbe Iron Works Inc., 41 Clark street, has been formed by Frank B. Garbe and associates, to engage in manufacture of iron products.

CHICAGO—Braufeld Mfg. Co., 228 North LaSalle street, has been incorporated to deal in metal specialties, by Leon J. Braude, Erich E. Pacyna and Rudolph Shapira. Correspondent: James Percival Pio, 1717-19 Builders building, 228 North LaSalle street.

CHICAGO—Rail-Free Spike Co., 59 East Van Buren street, has been incorporated to manufacture railroad spikes and other railroad equipment, by Michael R. Kasunas, Laurence Vanness and Robert J. Hummer. Correspondent: Hummer & Hummer, 69 West Washington street.

CHICAGO—Premier Products Co. Inc., 1800 Grace street, has been incorporated to manufacture mechanical appliances, devices, and equipment, by A. J. Pfeifer, A. W. Rilker and DeForest Showley. Correspondent: Premier Products Distributors, Grace and Ravenswood avenues.

CHICAGO—National Brewing Co. Inc., 444 St. James place, has been incorporated with 400 shares of par value common to manufacture beers, by Benjamin A. Sears, Maurice H Axelbrod, and Nathan D. Fleischman. Correspondent: Charles S. Vicker, 111 West Washington street, suite 957.

CHICAGO—Royal Laboratories Inc., 230 East Ohio street, has been incorporated to manufacture condensers and other electrical and mechanical specialties, by David Korup, Gus Ostrom and Mable Ostrom. Correspondent: Jack Rosen, suite 1713, 160 North LaSalle street.

CHICAGO—Chicago Cinema Products Co., 1750 North Springfield avenue, has been incorporated with 500 shares of no par value common to manufacture motion picture devices, by Alexander M. Berg, Walter W. Pitann, and Arthur Pitann. Correspondent: Lavin & Jaffee, suite 1125, 33 North LaSalle street.

GREENVILLE, ILL.—Nevinger Mfg. Co. has been incorporated to manufacture water heating and oil burning equipment, by R. M. Coates and associates, associated with Coates Steel Products Co., Greenville, Ill.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids April 17 as follows: Schedule 2153, one melting furnace unit, delivery at Washington; April 20, schedule 2149, five electric arc welding sets, delivery at Brooklyn, N. Y., and Mare Island, Calif.; schedule 2154, one gasoline engine-driven, self-propelled crane, delivery at Mare Island, Calif.; schedule 2184, one motor-driven combination shear, punch, coper and notcher, delivery at Brooklyn, N. Y.; schedule 2190, one motor-driven milling machine, delivery at Norfolk, Va.; schedule 2191, one motor-driven surface grinder, delivery at Norfolk, Va.

Florida

HAINES CITY, FLA.—Polk Co., Ralph Polk, president, has made application for loan to build a canning plant.

MIAMI, FLA.—George Levinson and Frank J. Corr have leased the building at 140-146 North West First street for manufacture of boxes and will install machinery.

OSCEOLA, FLA.—Tal Tongate is planning to erect a cotton gin of the Continental type and will install modern equipment.

Kentucky

COVINGTON, KY. — New England Distilling Co. is planning to build an addition to its plant.

MAYSVILLE, KY.—Maysville Water Co. is having plans prepared by D. D. Blackwelder, Greenville, S. C., for erection of filtration plant to cost about $70,000.

Maryland

ANNAPOLIS, MD.—City will take new bids soon on an incinerator to cost about $35,000. B. L. Crosier is engineer.

CUMBERLAND, MD.—Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is making surveys and estimates on a proposed municipal electric light and power

GOOD USED EQUIPMENT

For

DIE CASTING
FORGING INDUSTRY
MACHINE SHOPS
POWER PLANTS
ROLLING MILLS
STAMPING
and
ALLIED INDUSTRIES
STRUCTURAL,
BOILER
and
TANK INDUSTRY

BENDING ROLL—25′ 6″ NILES BEMENT POND Plate, Pyramid Type. Arr. for MD. Top roll 24-7/8″ dia. Bottom rolls 18″ dia. Capacity 1″ plate. Drop end housing.
BRAKE—12′ 6″ LOY & NAWRATH Power Press, 1/4″ cap., AC MD.
CAR WHEEL BORING MILL—42″ NILES BEMENT POND Vertical, arranged for dir. conn. MD with and including 7-1/2 HP, 3/60/220 AC motor and starter and equipped with facing attachment. All quick change feeds and speeds.
CRANE—5-T. SHEPARD Overhead Electric Traveling, 52′ 4″ span, 230 v. DC. Also equipped for Bucket & Magnet operation. 350 feet of Double "A" Frame Runway.
DIE SINKER—No. 3 PRATT & WHITNEY with cherrying attachment, swivel vise and countershaft.
FORGING MACHINE—2″ AJAX New Model, Steel Frame.
HEADER—No. 2 O.D.T.S. WATERBURY FARREL Open Die, Triple Stroke. Capacity 1/4″ to 3/8″ dia. wire. BD. Like new.
PRESS—No. 6-1/2 BLISS Straight Side, Double Crank with spring counterbalance. Belt drive. 54″ between housings. 8″ stroke.
OTHER MECHANICAL AND HYDRAULIC PRESSES FOR A WIDE VARIETY OF TYPES AND CAPACITIES OF WORK.
ROLLING MILL—Rolls 24″ wide by 12″ dia. and equipped with a 22 HP, 220 v. 3 ph. 60 cy. Western Electric Motor with starter and switch box.
SHEARS—Gate. 62″ STAMCO. Capacity 1/2″ plate, 18″ gap. Driven by a 20 HP, 3 ph. 60 cy. AC motor. Power actuated hold-down clamp. Modern machine. Practically new.
No. 10 BUFFALO for bars and shapes. Capacity up to 3-7/8″ rounds and corresponding duty in shapes. Direct connected AC MD with motor.
SWAGING MACHINES—(2) No. 7 LANGELIER, equipped with Semi-Automatic Hydraulic Feed and Automatic Pneumatic Gripping Jaws. Capacity—tubing 3-1/2″, solid hot 3″, solid cold 2-1/4″. Arranged for motor drive and equipped with direct connected Oil-Gear Hydraulic Pump.

In addition to the above, we have available a wide variety of good equipment in various types and sizes.

Manufacturing RITTERBUSH & COMPANY, INC. Equipment
30 CHURCH ST.
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HEADING SPECIALISTS

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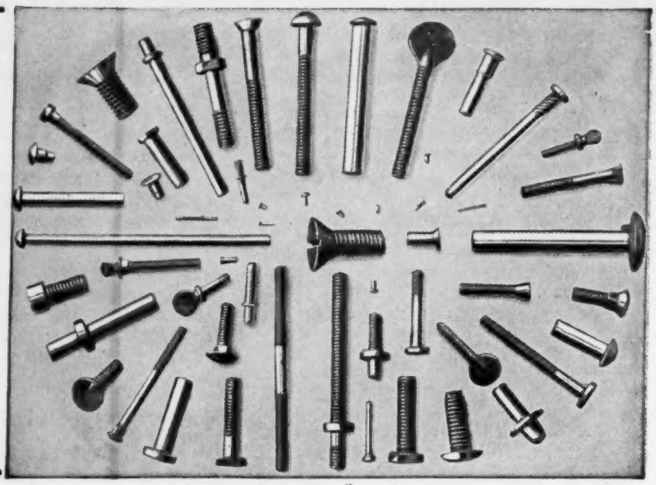

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plant, report on which is expected soon.

North Carolina

LEXINGTON, N. C.—City will receive grant of $100,000 for water supply system, including pumping station and supply main to filtration plant.

South Carolina

COLUMBIA, S. C.—Governor Ibra C. Blackwood has approved a bill authorizing development of Santee-Cooper project, including construction of hydroelectric plant at an estimated cost of $34,000,000.

GREENWOOD, S. C.—Greenwood county has PWA loan of $1,000,000 for developing power project at Buzzard's Roost on Saluda river. D. T. Duncan, Greenwood, local engineer, is in charge of project.

West Virginia

HUNTINGTON, W. VA.—Fensenmeier Brewing Co. is rehabilitating the plant of the former West Virginia Brewing Co. and will install additional equipment. Cost is estimated at $200,000, including equipment.

Missouri

CALIFORNIA, MO.—City will take bids in May for a municipal electric light and power plant for which $145,000 has been appropriated. W. B. Rollins & Co., Railway Exchange building, Kansas City, Mo., are consulting engineers.

KANSAS CITY, MO.—M. K. Goetz Brewing Co., Sixth and Albermarle streets, St. Joseph, Mo., will build a brewery at Seventeenth street and Indiana avenue, Kansas City, Mo., to cost about $400,000. All equipment will be electrically operated.

ST. LOUIS—Austin-Western Road Machinery Co., 400 North Michigan avenue, Chicago, has rented warehouse space in one of the buildings of Central Industrial District Inc. for sales and service station.

ST. LOUIS—A. H. Lewis Medicine Co., J. H. Howe, president, is planning to construct a four-story building to cost between $100,000 and $150,000, including machinery and equipment.

ST. LOUIS—Internation Oil Burner Co. has been incorporated by Sol Wolf and Sidney J. Heiman, 3971 Utah place.

Arkansas

HOPE, ARK.—City, R. A. Boyett, mayor, is planning to install an electric generator in its power plant to cost about $40,000.

Oklahoma

TULSA, OKLA.—Iverson Tool Co. has increased its capital from $100,000 to $150,000.

Wisconsin

MILWAUKEE—Industrial Lubrication Co., 606 West Wisconsin avenue, L. Roy Smith president, has moved its plant and offices to Burlington, Wis. The company manufactures lubrication devices.

Minnesota

ALBERT LEA, MINN.—City has retained Black & Veatch, engineers, Kansas City, Mo., to make a survey for a proposed municipal electric light and power plant.

MINNEAPOLIS, MINN.—Welter Furnace Mfg. Co. Inc. has been formed by Nicholas Welter and M. A. Welter, 4306 Garfield avenue, with $50,000 capital, to manufacture heating equipment, including oil burners.

ST. PAUL, MINN.—Northern Pacific, O. M. Rognan, company architect, Railroad building, St. Paul, is preparing plans for a 1-story addition to its engine house and shops at Jamestown, N. Dak., to cost about $25,000, with equipment.

Iowa

CORNING, IOWA—Bids for a municipal electric light and power plant have been rejected and new tenders will be asked in May. Project includes three diesel engine-generator units, tanks and other equipment. Young & Stanley Inc., Muscatine, Iowa, are engineers.

WELLMAN, IOWA—City plans construction of a municipal electric light and power plant to cost $85,000, including a 350-horsepower diesel engine.

Kansas

McPHERSON, KANS.—Plans have been nearly completed for a municipal electric light and power plant to cost about $21,000. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is engineer.

Pacific Coast

EXETER, CALIF. — Specifications have been completed by the Southern California Gas Co. for an office building here to include sales room and storage facilities.

LOS ANGELES—Boyle Mfg. Co. Inc., W. J. Boyle Sr., president, manufacturer of sheet metal, is building an addition to its plant here, to cost approximately $75,000.

LOS ANGELES—Washington Iron Works will build a $75,000 reinforced concrete truck freight building at 1908 East Sacramento street. William V. Kernan is architect, and Pacific Iron & Steel Co., general contractor.

SAN DIEGO, CALIF.—Balboa Brewing Co., Wayne D. McAllister vice president, is planning to build a brewing plant at a cost of more than $1,000,000 for land, buildings and equipment.

VISALIA, CALIF. — Mt. Whitney winery is building a plant to cost about $50,000, at Cutler near here, for use about Sept. 15.

PORTLAND, OREG. — Leslie M. Scott, chairman, announces that Oregon highway commission is considering purchase of crushing equipment and machinery for highway and maintenance work.

ANACORTES, WASH. — William Tweedale, Index, Wash., and Joseph Foreman, Seattle, representing the Miners' Smelting & Refining Co., are negotiating with the Port of Anacortes for a smelter site of 20 acres on which to locate a plant to be served by independent miners of Washington, British Columbia and Alaska.

OLYMPIA, WASH.—E. F. Banker, state director of conservation and development, has released the following tonnages estimated for the Grand Coulee dam and power project: Reinforcing steel, 12,750 tons; miscellaneous steel, 9485 tons; sluice gates, 7841 tons; structural steel, 19,154 tons; penstocks, etc., 12,715 tons; turbines and valves, 14,273 tons; electrical equipment, 29,372 tons; steel sheet piling, 23,591 tons.

SEATTLE—Master Oil Burner Co., 3674 Fourth street South, will build a 2-story plant 75 x 75 feet, with 4-story tower.

SEATTLE, WASH.—Newport Mining Co. has been incorporated with capital of $100,000, by F. E. Knowles, J. Rokes and Clayton Aldridge, care of Hartman & Hartman, Burke building, Seattle.

TACOMA, WASH. — Independent Breweries Inc., has been organized with capital of $130,000 through Raymond De Moise, 1016 Washington building, Tacoma, Wash.

Dominion of Canada

OTTAWA, ONT.—Ottawa Electric Co. Ltd. plans construction of a distributing substation of 5000 kilowatts capacity, to cost $100,000, most of which is for equipment.

TORONTO, ONT.—Ontario Hydroelectric commission has asked the government for $300,000 for construction of a 1000-horsepower generating plant on Albany river to supply power to neighboring mining projects. Preliminary steps toward approval have been made.

New Trade Publications

CONVEYORS—Mathews Conveyor Co., Ellwood City, Pa., engineer and manufacturer of industrial conveyors, has issued a booklet devoted to showing the universal application of its conveyors to almost any industrial use. It is profusely illustrated and details of construction and many installations are pictured.

RUSTPROOFING—Dearborn Chemical Co., Chicago, in a current booklet covers the claims of its product, No-Ox-Id, a rustproofing compound, designed to protect steel and iron against the ravages of corrosion. It is well illustrated to show applications in the railroad field under a wide variety of conditions.

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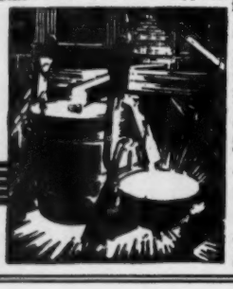

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